AD-769 061

HELICOPTER INSPECTION DESIGN REQUIREMENTS

RCA Government and Commercial Systems

PREPARED FOR

Army Air Mobility Research and Development Laboratory

May 1973

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The Eustis Directorate of the U.S. Army Air Mobility Research and Development Laboratory is conducting a series of investigations of current Army helicopter maintenance operations and procedures, which include scheduled maintenance inspection systems and practices. It is intended that the results of these investigations will be directed toward determining the best way to achieve economical inspection and maintenance procedures, while keeping abreast of the rapid advances in aircraft design.

The contract was awarded specifically to analyze existing aircraft and currently used inspection techniques to determine the impact of design characteristics on the ease or difficulty of inspection. The evaluation was directed primarily toward identifying design approaches for improving the inspection process in future aircraft. A secondary objective was the identification of possible inspection aids.

This report provides a reasonable insight into the problems associated with the design/inspection interface, while reflecting a possible means for measuring maintainability characteristics. Results of the contract will be used in future studies dealing with helicopter maintenance and inspection procedures.

The technical monitor for this contract was Mr. William B. Sweeney, Military Operations Technology Division.

Project 1F162205A119
Contract DAAJ02-72-C-0052
USAAMRDL Technical Report 73-22
May 1973

HELICOPTER INSPECTION DESIGN REQUIREMENTS

Final Report

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FORT EUSTIS, VIRGINIA

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SUMMARY

This study of Army helicopter inspection design requirements was performed by the RCA Corporation with the participation of the Kaman Aerospace Corporation. The major purpose of the study was to analyze existing aircraft and presently used inspection techniques to determine the impact of present design on the ease of inspection. The evaluation was aimed toward providing specific definition of design approaches for improving the inspection function in future aircraft.

Initial engineering analyses established failure mode symptoms and inspection techniques for helicopter components which contribute significantly to the inspection problem. Analysis results were supplemented by field interviews with technical inspectors experienced in the inspection of six applicable aircraft (AH-1, UH-1, CH-47, CH-54, OH-58 and OH-6). The field survey helped to pinpoint components in each aircraft which present inspection problems. Problem areas were then reviewed and classified into categories for further analysis. These categories included candidates for component or installation redesign, and changes in inspection technique or interval. Engineering analyses were then performed in each problem area to explore for worthwhile solutions. This report contains the resulting specific recommendations for design approaches which offer improvements in inspection efficiency in future designs and inspection aids which warrant consideration for application to present or future designs.

The MAVIS (Model for Analysis of Vehicle Inspection Systems) computer model, developed under USAAMRDL Contract No. DAAJ02-71-C-0047, was utilized to assess quantitatively the improvements in inspection efficiency that can be realized through the adoption of the study's recommendations. The modeling indicated reductions in inspection and total maintenance manhour requirements and also noticeable improvement in aircraft availability and mission reliability.

AD-769 061

Unclassified
Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author) RCA/Government and Commercial Systems Aerospace Systems Division Burlington, Massachusetts	2a. REPORT SECURITY CLASSIFICATION Unclassified 2b. GROUP

3. REPORT TITLE

HELICOPTER INSPECTION DESIGN REQUIREMENTS

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)

Final Report

5. AUTHOR(S) (First name, middle initial, last name)

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Fred W. Hohn
Frank E. Starses

6. REPORT DATE May 1973	7a. TOTAL NO. OF PAGES 211	7b. NO. OF REFS
8a. CONTRACT OR GRANT NO. DAAJ02-72-C-0052 b. PROJECT NO. 1F162205A119	9a. ORIGINATOR'S REPORT NUMBER(S) USAAMRDL Technical Report 73-22	
c. d.	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	

10. DISTRIBUTION STATEMENT

Approved for public release; distribution unlimited.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY Eustis Directorate U. S. Army Air Mobility R&D Laboratory Fort Eustis, Virginia

13. ABSTRACT

Existing aircraft and presently used inspection techniques were analyzed to determine the impact of present design on the ease of inspection. Initial engineering analyses established failure modes and inspection techniques for helicopter components which contribute significantly to the inspection problem. Analysis results were supplemented by field interviews with inspectors experienced in inspection of six aircraft types (AH-1, UH-1, CH-47, CH-54, OH-58, and OH-6). The field survey helped definitize components in each aircraft which present inspection problems. Problem areas were then reviewed and classified into categories. These categories included candidates for component or installation redesign, and changes in inspection technique or interval. Engineering analyses then explored for worthwhile solutions. This report contains the resulting specific recommendations for design approaches which offer improvements in inspection efficiency in future designs and inspection aids which warrant consideration for application to present or future designs. The MAVIS (Model for Analysis of Vehicle Inspection Systems) computer model, described in USAAMRDL Technical Report 72-35, was used to assess quantitatively the improvements in inspection efficiency available through the adoption of the study's recommendations. The modeling indicated significant reduction in maintenance man-hour requirements and improvement in aircraft availability and mission reliability.

DD FORM 1 NOV 65 1473 REPLACES DD FORM 1473, 1 JAN 64, WHICH IS OBSOLETE FOR ARMY USE.

Unclassified
Security Classification

213

Unclassified
Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
Preventive Maintenance Scheduled Inspection Inspection Design Requirements Inspection Techniques Design Approaches for Inspection Inspection Problem Areas Inspection Aids MAVIS (Model for Analysis of Vehicle Inspection Systems) Computer Model						

Unclassified
Security Classification

FOREWORD

This study of helicopter inspection design requirements was performed under Contract DAAJ02-71-C-0052 with the Eustis Directorate, U.S. Army Air Mobility Research and Development Laboratory, Fort Eustis, Virginia. The work was authorized by DA Project 1F162205A119. The study was under the general technical cognizance of Mr. William B. Sweeney of the Military Operations Technology Division. The analysis resulted in the recommendation of design approaches for more effective inspection on future Army helicopters. New inspection aids and techniques are also discussed.

The authors wish to acknowledge the leadership and contributions made to this program by Messrs. Bruce B. Wierenga of the RCA Corporation and Thomas N. Cook of the Kaman Aerospace Corporation technical staffs. Valuable engineering contributions were made by Robert B. Bossler, Jr., also of Kaman Aerospace Corporation. Acknowledgement of the contribution of Army personnel from the Aviation Maintenance Brigade, Hunter Army Airfield; First Cavalry Division, Fort Hood; and the Aircraft Maintenance Training Division, Fort Eustis, who provided valuable study input data, is also extended.

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BACKGROUND

In 1971, U.S. Army Air Mobility Research and Development Laboratory contract DAAJ02-71-C-0047 was issued for analysis of Army helicopter inspection requirements. The major purpose of the analysis was to perform a substantive engineering study of aircraft maintenance scheduled inspection to select and recommend the inspection concept which can be most effectively applied to all typical helicopter types required within the planned Army mission envelope. Computer modeling was employed to determine the best inspection scheme for present and future aircraft on a "when and what to inspect" basis. The results of the analysis are described in USAAMRDL Technical Report 72-35 dated September 1972.

The analysis of Army helicopter inspection requirements was limited in that it did not address the "how to inspect" or the need for seeking design approaches for better inspection. Understanding the need for study of these important areas was an inherent byproduct of the analysis. Field work and user maintenance personnel interviews which were conducted indicated that present inspections can be characterized as being:

- Inconclusive due to poor definition or knowledge of the failure mode symptoms of the components being inspected.
- Inconclusive due to lack of a convenient gauge of wear or need for adjustment and, therefore, dependent upon individual subjective judgement.
- Difficult and inconvenient to conduct due to poor access, poor visibility, etc,of the components to be inspected.
- Inefficient due to subsystem arrangement or to fastener, cover and step designs which make buttoning and unbuttoning actions a major task.
- Destructive to the aircraft itself due to need for removal and disassembly of inspection plates and covers during the inspection.

It was apparent that additional effort was required to evaluate inspection techniques and aircraft design for inspection. The helicopter inspection design requirements study described in this report was, therefore, initiated.

FAILURE SYMPTOMS AND INSPECTION TECHNIQUES

OBJECTIVES AND PROCEDURES

Objectives

The objectives of this study task were as follows:

1. Determine failure modes and symptoms for helicopter components which contribute significantly to the inspection problem.
2. Examine compatibility of inspection techniques with anticipated failure modes and, where necessary, develop recommendations for improved methods or techniques.

Procedure

The following step-by-step procedure was followed to complete the objectives of this task.

1. Using the Master Configuration File of generic component information developed under Contract DAAJ02-71-C-0047, those components which are the major contributors to the inspection problem and which represent areas where the most improvement can be achieved were determined. This selection was based upon the following critical factors:

    a. High Failure Rate
    b. High Inspection Time
    c. Safety
    d. Detection Probability

    Further study effort concentrated on these components.

2. The specific components from each aircraft type under study which match the reduced listing of generic components were selected. Work unit code manuals for each existing type and aircraft configuration files from Contract DAAJ02-71-C-0047 were used as the sources for proper component complement and nomenclature for

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the OH-6, OH-58, OH-1, AH-1, CH-47 and CH-54 aircraft.

3. Maintenance records were searched for the following data on the selected components for each helicopter model:

   a. Important Failure Modes
   b. Failure Rate
   c. When Discovered

4. A "Failure Mode - Symptom - Inspection Technique" summary form was created and completed for each component and each aircraft model. Included is information of 3a through c above plus the following:

   a. Symptoms of Failure

   b. Currently Specified Inspection Techniques (from checklists)

   c. Estimated Effectiveness of Current Techniques

   d. Estimate of Time Required to Perform the Inspection

5. A form to be used in field survey interviews of Army Maintenance personnel was developed. This form includes the following:

   a. Failure Modes
   b. Failure Symptoms
   c. Current Inspection Techniques
   d. Effectiveness of Current Techniques
   e. Suggested Technique Improvements
   f. Suggested Design Improvements
   g. Accessibility Rating
   h. Suggested Accessibility Improvements

6. Trial-run interviews with Kaman Aerospace Corporation mechanics were performed, and the form was modified for improved interview effectiveness.

7. Initial interviews were conducted at Hunter Army Airfield for the UH-1.

8. The interview form was simplified to increase efficiency.

9. Interviews were completed at Fort Hood (CH-47, OH-58) and Fort Eustis AMTD (AH-1, CH-54, OH-6).

10. Survey results were compared with previous engineering analyses.

SELECTION OF COMPONENTS TO BE EVALUATED

The initial study effort involved analysis to select a list of components which would seem to represent the major contributors to the inspection problem. These, then, would be the list of items for further consideration in the study. This list would be increased as the result of field interviews and then reduced as unproductive areas became apparent.

The considerations involved in the selection and components selected are defined in the paragraphs which follow.

High Man-Hour Consumers

Among the most promising candidates for inspection technique and/or design improvement are those components which have a high inspection man-hour to flight-hour ratio. It is reasonable to expect that among these high inspection man-hour consumers will be a preponderance of components having such shortcomings as:

- Poor accessibility
- Requires partial disassembly
- Inspection cannot be performed on aircraft
- Requires removal of other components
- Requires depletion and reservicing of pressurized systems
- Requires elaborate inspection setup or preparation
- Requires precision dimensional measurement
- Involves use of unique inspection devices which require high personnel skill levels

The recently completed study, "Analysis of Army Helicopter Inspection Requirements", Contract DAAJ02-71-C-0047, produced computer model outputs which projected inspection man-hour per flight-hour expenditures for individual components from five Army helicopter types: AH-1, UH-1, CH-47, CH-54 and OH-58.

Projections were predicated on use of the recommended phased inspection schedule consisting of 100-hour intervals and an 800-hour cycle. The computer model outputs are identified as "Model Option A Outputs" and are included as Appendix VII in the final report for the above study. A sample print-out page is shown as Figure 1 in this report.

Fleet-Wide Averages

Two different components, each having the same inspection man-hour projection, may make tremendously different contributions to fleet-wide man-hour expenditures if one is unique to a single helicopter type and the other is incorporated in all helicopters in the fleet. It was felt that greater dividends would be realized in terms of fleet-wide man-hour reductions if the study concentrated on components with high average man-hour projections. For this reason, weighted man-hour averages were calculated for each component. These calculations were based upon present inventory helicopter populations. The weighting factors used were:

AH-1 = 7
UH-1 = 56
CH-47 = 6
CH-54 = 1
LOH = 21

Table I lists those components which had the highest average inspection man-hour requirements. The components are arranged in descending order of their requirements. In a later paragraph, the extent to which this list was used in selecting components will be explained.

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

PAGE 2

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	QPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR ENT	UNSCH REPR ENT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
1104000	COCKPIT/CABIN INTERIOR SUBSYS													
1104010	INSTRUMENT CONSOLE	1	0	6	0	1	0	6	7	0	5	0	0	800.0
1104030	FLOOR PANEL	7	1	6	54	7	7	40	109	3	18	0	0	400.0
1104040	SEAT TRACK	2	0	1	0	1	0	2	2	0	1	0	0	800.0
	SUBSYSTEM TOTAL		1	13	54	8	8	49	117	3	25	0	0	
1105000	ENG COMPARTMENT/TUNNEL SUBSYS													
1105010	FIREWALL	2	4	6	0	10	11	23	44	7	15	0	0	100.0
1105020	SCUPPER/DRAIN	2	0	*	0	0	0	*	1	0	0	0	0	400.0
1105030	HANGER BRG SUPPT STRUCTURE	4	1	3	0	2	1	5	8	1	5	0	0	400.0
	SUBSYSTEM TOTAL		4	9	0	13	12	28	53	8	20	0	0	
1106000	FITTING/HARDPOINT SUBSYSTEM													
1106010	ENGINE FITTING	6	0	2	46	2	1	14	63	0	7	0	0	400.0
1106020	TRANSMISSION/GEARBOX FITTING	1	3	*	0	2	6	*	9	4	0	0	0	100.0
1106030	TAIL BOOM ATTACH FITTING	4	0	6	0	7	0	15	22	0	9	0	0	400.0
1106040	LANDING GEAR FITTING	4	0	1	0	1	0	2	3	0	2	0	0	400.0
1106050	CARGO HOOK FITTING	1	0	*	0	0	0	*	1	0	0	0	0	800.0
	SUBSYSTEM TOTAL		3	9	46	13	7	31	98	5	18	0	0	
	SYSTEM TOTAL		272	431	829	280	642	1246	2997	444	809	10	2	

Figure 1. Sample of Model Option "A" Output.

TABLE I. AVERAGE INSPECTION MAN-HOURS AND TECHNIQUES

Comp. Code	Nomenclature	Inspection $MH/10^4FH$	Technique Code
450204	Cylinder	174	12,25
220101	Engine Assembly	142	11,12,2[illegible]
140401	Swashplate Assembly	92	11,12,25
110102	Skin	85	
260201	T.R./Aux Power Plant Shaft	76	
450104	Hydraulic Filter	65	12
260605	Tail Rotor Gearbox Assembly	62	11,12
140510	Cable Assembly/Turnbuckle	51	13,26
260603	Main Rotor Transmission Assembly	51	12
110101	Frame/Stringer	50	
140505	Crank/Lever/Arm, Etc.	46	11
150101	M.R. Blade Assembly	46	11,24
140403	Scissor and Sleeve Assembly	41	11,12
260203	Shaft Coupling - Zurn Type	41	
140301	Controls Mixer Assembly	38	11,12
420206	Battery	38	
260801	Pylon Mount Assembly	35	
110301	Hinged Access Door/Cowling	34	26
140205	Push-Pull Rod	34	11
460101	Fuel Cell	31	
140504	Push-Pull Rod	28	11
140206	Crank/Lever/Arm, Etc.	27	11
140101	Collective Stick Assembly	25	
140201	Cyclic Control Stick	25	
260604	Intermediate Gearbox Assembly	24	12
260205	Hanger Bearing	23	
140105	Crank/Lever/Arm, Etc.	22	11
420302	Aircraft Wiring	22	
460102	Sump Pump	21	
150201	T.R. Blade Assembly	19	24
220503	Fire Detector Element	19	23
140406	Swashplate Assembly (Heavy Helo)	18	11,12,25
150118	Stabilizer Damper	18	12,27
290201	Particle Separator Assembly	18	11
150106	Pitch Varying Housing/Assembly	17	11
290101	Engine Mount	17	19
290804	Engine Control Linkage	17	
420207	Battery Sump Jar	17	
110108	Horizontal Stabilizer Section	16	11

TABLE I - Continued			
Comp. Code	Nomenclature	Inspection MH/10^4FH	Technique Code
140104	Push-Pull Rod	15	11
140701	Push-Puil Rod	15	11
260204	Shaft to Coupling Clamp	15	11,12
510611	Exhaust Gas Temperature Indicator	15	23
130103	Cross Tube	14	11
260101	Engine Drive Shaft	14	12
140702	Crank/Lever/Arm, Etc.	13	11
110202	Hinged Cabin Door	12	
110304	Removable Fairing/Cowling	12	
140204	Torque Tube	12	
150116	Control Tube/Rod	12	11
420201	Generator	12	
450102	Hydraulic Pump	12	
260107	Eng/Sync Drive Shaft (Heavy Helo)	11	12
450112	Hose/Line	11	
110201	Sliding Cabin Door	10	
110501	Firewall	10	
120104	Pilot/Copilot Seat/Cushion	10	
240101	APU Engine Assembly	10	11
130101	Skid Tube	9	
140404	Link/Rod/Lever, Etc.	9	11,12
140512	Chain Assembly	9	11,26
140601	Cross Head/Star	9	11
140703	Torque Tube	9	11
150108	Hub Assembly	9	
150117	Stabilizer Bar Assembly	9	
260103	Shaft Coupling - Zurn Type	9	
260606	M.R. Transmission (Heavy Helo)	9	12
260802	Damper	8	
510801	Fuel Quantity Indicator	8	
110109	Step/Hand Hold	7	
110603	Tail Boom Attach Fitting	7	12
140208	Force Gradient Assembly	7	
140602	Pitch Change Link	7	11
150203	Hub Assembly	7	12
220301	Fuel Control Assembly	7	11
220403	Oil Filter	7	12
405101	Reservoir	7	3
460103	Fuel Filter	7	12

TABLE I - Continued			
Comp. Code	Nomenclature	Inspection MH/10^4 FH	Technique Code
110602	Transmission/Gearbox Fitting	6	
130102	Skid Tube Shoe	6	
150109	Hub Oil Reservoir	6	
150114	Pitch Link	6	11
150122	Pitch Vary HSG/Assembly (Heavy Helo)	6	
220401	Oil Tank	6	
420105	Receptacle	6	
490902	Chip Detector	6	
110303	Door/Cowl/Pltfm Latch Mechsm	5	
110403	Floor Panel	5	
130502	Tail Skid Tube	5	
150111	Centrifugal Droop Stop Assembly	5	11
220402	Oil Strainer	5	12
260102	Shaft Coupling - Thomas Type	5	11
260704	Oil Filter	5	12
260803	Lift Link	5	
290102	Engine Mount Bearing	5	11
291002	Oil Cooler Blower	5	
420108	Inverter	5	
440202	Search Light	5	
440203	Position/Formation Light	5	
460106	Line/Hose	5	
490702	Air Blower	5	
110204	Door Latch Mechanism	4	
110205	Door Jettison Mechanism	4	
120201	Passenger Seat	4	
220603	Igniter Plug	4	
260602	Combining Transmission Assembly	4	12
290301	Inlet Screen	4	
420109	Control Panel	4	
490601	Cargo Suspension Assembly	4	
510107	Attitude Indicator	4	26
130302	Brake Assembly	3	11
150123	Hub Assembly (Heavy Helo)	3	
220302	Fuel Control Strainer	3	12
260105	Hanger Bearing	3	
290302	Inlet Duct/Plenum Chamber	3	
110107	Cargo Ramp	2	
110302	Hinged Work Platform	2	

TABLE I - Continued			
Comp. Code	Nomenclature	Inspection MH/10^4FH	Technique Code
110503	Hanger Brg Support Structure	2	
150103	Damper Assembly	2	
260202	Shaft Coupling - Thomas Type	2	11
260301	Rotor Drive Shaft and HSG Assembly	2	
110105	Escape Hatch	1	
120202	Lap Belt	1	
130201	Shock Strut	1	11
130203	Scissors Assembly	1	
130205	Wheel Lock	1	
130301	Power Brake Master Cylinder	1	
140107	Damper Assembly	1	
140803	SAS Control Actuator	1	
150115	K Bar	1	11
220307	Fuel Filter	1	12
220309	Flow Divider Assembly	1	
220702	Air Bleed Actuator/Strainer	1	12
240301	Fuel Control Assembly	1	
260401	Fan Drive Shaft Assembly	1	12
260601	Engine Transmission Assembly	1	12
260608	T.R. Gearbox Assembly (Heavy Helo)	1	11,12
260804	Tubular Mount Assembly	1	
290202	Door Actuator	1	
290705	Hydraulic Starter	1	

Complex Inspection Methods

Another factor considered in determining which components would be best to concentrate upon was the methods of inspection they are currently subjected to. It is reasonable to assume that inspection costs, in terms of man-hours and skill levels, rise along with the degree of complexity of the inspection method(s) specified. The last column of Table I lists code numbers for inspection methods used on the respective components which are above and beyond simple visual checks or manual play/clearance checks. An explanation of the codes is given in Table II.

Selection of Components

As indicated earlier, the high inspection man-hour consumers list and the complex inspection requirements list (see Figure 1) were used as guides in selecting those components which offered the greatest opportunity for making inspection technique and/or design improvements. Each component was reviewed individually, however, and the component selection process was tempered somewhat by application of sound engineering judgement. For example, the fuselage skin, component code 110102, although high on the list of man-hour consumers, was not selected for in-depth evaluation. In this case it was felt that the expenditure of inspection man-hours was large simply because of the extensive area which had to be visually examined. Little hope was seen of improving this situation either by change of technique or design.

On the other hand, oil filter, component code 240402, was selected for deeper analysis in spite of not being a high man-hour consumer. It was felt that perhaps some helicopter lubrication systems do not have the advantage of filter inspection aids. Such innovations as pop-up clog indicators and/or cockpit differential pressure indicators can dramatically reduce inspection time as well as maintenance-induced damage.

One final question considered while selecting components for analysis was: "Regardless of time spent, how effec-

TABLE II. INSPECTION METHOD CODES

Code No.	Inspection Method
1	BITE
2	BIM
3	Spectrographic Oil Analysis
4	Operational Visual Check
5	Operational Audio Check
6	Operational Vibratory Check
7	Operational Temperature Check
8	Functional Check
9	Static Visual Check
10	Manual Play/Clearance Check
11	Precision Dimensional Check
12	Torque Check
13	Tension Check
14	Spring Rate Test
15	Vacuum Check
16	Pressure Test
17	Flow Rate Check
18	Optical Magnification Inspection
19	Dye Penetrant Inspection
20	Magnetic Particle Inspection
21	X-Ray Inspection
22	Elect/Avionic Check (Common Meters)
23	Elect/Avionic Check (Special Test Set)
24	Tap Test
25	Friction Check
26	Alignment Check
27	Time Check

tive is the currently specified inspection technique? Is it possible that another technique may significantly improve fault detection confidence?" Components selected on this basis included torque sensor, code 290103, and freewheeling assembly, code 260501.

In all, 164 components were thusly selected for in-depth analysis. Sixty-three were considered sufficiently unique to be listed individually, but the remaining 101 were conveniently divided into 20 homogeneous groups for more efficient treatment. All the selected components and groups of components are listed in Table III. Subsequent sections of this report will explain how items in Table III were treated in the course of in-house engineering analysis and during later field surveys.

AIRCRAFT ANALYSIS SHEETS

Definition of Specific Components of Each Aircraft Type

The preceding section described the selection of the generic components initially considered to be of most importance to the study. The next step in the study procedure involved compilation of the components in each of the six aircraft types which correspond to the generic component listing. This was required because the study efforts which follow address inspection techniques and designs for inspection for specific inventory aircraft types rather than generic components. Basic data sources utilized were: (1) the aircraft configuration files developed under Contract DAAJ02-71-C-0047 which define the generic component complement of each aircraft (with the exception of OH-6),(2) aircraft series -20 and -35 technical manuals, and (3) Navy aircraft maintenance work unit code manuals which provide a parts listing for each aircraft which is used in reporting maintenance actions.

Component Data Analysis Form

After compilation of the specific components for each aircraft type in terms of work unit code and proper nomenclature, an analysis form was developed for recording component data relevant to the study. This form is shown in Figure 2. The form entries required and the data sources utilized in completing the form are tabulated below:

TABLE III. COMPONENTS TO BE ANALYZED	
Component Code	Nomenclature
110108	Horizontal Stabilizer Section
110201	Sliding Cabin Door
110603	Tail Boom Attach Fitting
130103	Landing Gear Cross Tube
130201	Landing Gear Shock Strut
130203	Landing Gear Scissors Assembly
130302	Brake Assembly
140101	Collective Stick Assembly
140108	Engine Droop Eliminator Unit
140201	Cyclic Control Stick
140301	Controls Mixer Assembly
140401	Swashplate Assembly
140403	Controls Scissors and Sleeve Assembly
140406	Swashplate Assembly (Heavy Helo)
140512	T.R. Control Chain Assembly
140601	T.R. Cross Head/Star
150101	M.R. Blade Assembly
150106	Pitch Varying Housing Assembly
150108	M.R. Hub Assembly
150111	Centrifugal Droop Stop Assembly
150117	Stabilizer Bar Assembly
150122	Pitch Varying Housing Assembly (Heavy Helo)
150123	M.R. Hub Assembly (Heavy Helo)
150201	T.R. Blade Assembly
150202	T.R. Sleeve and Spindle Assembly
150203	T.R. Hub Assembly
220101	Engine Assembly
220301	Fuel Control Assembly
240101	APP Engine Assembly
240301	APP Fuel Control Assembly
260101	Engine Drive Shaft
260107	Eng/Sync Drive Shaft (Heavy Helo)
260201	T.R./Aux Power Plant Shaft
260301	Rotor Drive Shaft and Hsg Assembly
260401	Fan Drive Shaft Assembly
260501	Freewheeling Assembly
260503	Aux Power Plant Shaft Clutch
260601	Engine Transmission Assembly

TABLE III - Continued	
Component Code	Nomenclature
260602	Combining Transmission Assembly
260603	Main Rotor Transmission Assembly
260604	Intermediate Gearbox Assembly
260605	Tail Rotor Gearbox Assembly
260606	M.R. Transmission (Heavy Helo)
260607	Intermediate Gearbox Assembly (Hvy Helo)
260608	T.R. Gearbox Assembly (Heavy Helo)
260802	Pylon Damper Assembly
290101	Engine Mount
290102	Engine Mount Bearing
290103	Engine Torque Sensor
290201	Particle Separator Assembly
290201	Particle Separator Assembly (Heavy Helo)
290801	Control Quadrant Assembly
290803	Throttle Twist Grip Mechanism
290804	Engine Control Linkage
290809	Droop Compensator Cam Box
420108	Inverter
420206	Battery
420207	Battery Sump Jar
460101	Fuel Cell
460104	Engine Fuel Purifier
490601	Cargo Suspension Assembly
490602	Cargo Hook Assembly
490607	Hydraulic Winch Assembly
Group 1	Control Torque Tubes
Group 2	Cranks/Levers/Arms/Etc.
Group 3	Push-Pull Rods
Group 4	Control Cables
Group 5	Electric Fuel and Oil Pumps
Group 6	Gear Driven Fuel and Oil Pumps
Group 7	Lines and Hoses
Group 8	Filters
Group 9	Hydraulic Pumps/Motors
Group 10	Hydraulic Cylinders
Group 11	Hydraulic Dampers
Group 12	Generators
Group 13	Electric Actuators
Group 14	Zurn Drive Couplings

TABLE III - Continued	
Component Code	Nomenclature
Group 15	Thomas Drive Couplings
Group 16	Hanger Bearings
Group 17	Door Jettison Mechanisms
Group 18	Control Force Gradient Assembly
Group 19	Cooler Blowers
Group 20	Fire Detection Elements

GENERIC COMPONENT CODE ________ NOMENCLATURE ________ EST. INSP. MINUTES ________ PAGE __ OF __ HELICOPTER MODEL ________

WORK UNIT CODE	FAIL* RATE	PRIMARY FAILURE MODES			WHEN DISCOVERED (%)				REMARKS	CURRENT INSPECTION REQUIREMENTS & TECHNIQUE
NOMENCLATURE		CODE	DESCRIPTION	% TOTAL	FLT REQ	SCHED	ABORT	OTHER		
										DAILY:
										INTERMEDIATE:
										PERIODIC:
										-20 TECH. MANUAL:

*PER 10,000 FLIGHT HOURS

Figure 2. Component Data Analysis Form.

Form Entry	Data Source
Generic Component Code	Contract DAAJ02-71-C-0047 Master Configuration File
Generic Component Nomenclature	Contract DAAJ02-71-C-0047 Master Configuration File
Estimated Inspection Minutes	Contract DAAJ02-71-C-0047 Master Configuration File
Work Unit Code	Navy Work Unit Code (WUC) Manuals
Work Unit Nomenclature	WUC Manuals and/or Technical Manuals
Failure Rate	Contract DAAJ02-71-C-0047 Master Configuration File
Primary Failure Modes	Contract DAAJ02-71-C-0047 Data Base
Percent of Total Failures for Primary Failure Modes	Contract DAAJ02-71-C-0047 Data Base
"When Discovered" Percentages for Maintenance Actions*	Contract DAAJ02-71-C-0047 Data Base
Current Inspection Requirements and Techniques: Daily, Intermediate, Periodic:	Aircraft Checklists
-20 Technical Manual	Inspection Requirements Techniques and Symptoms from -20 Technical Manuals.

*Note: "Flight Red." percentage includes reports from pre-flight, post-flight and daily inspections. "Schedule" percentage includes reports from scheduled inspections. "Abort" percentage includes reports resulting from both pre-flight and in-flight aborts. "Other" percentage includes reports from flights with "No Abort", inspections other than flight-readiness or scheduled inspections, and other sources (ground handling, etc.).

Component Data Analysis Booklets

A component data analysis booklet was completed for each of the six aircraft types involved in the study. Each booklet contains filled-out component data forms (Figure 2) for each of the generic component types from Table III that are a part of that aircraft. These booklets are a basic data source and were used during the field interviews and in evaluating field interview results. They also presented a capsule view of the present inspection and failure situation for use during the review of inspection design approaches. Figures 3 through 5 are sample component data pages.

FIELD SURVEY

Field Survey Forms

The importance of properly conducted field surveys in this study is clear. Study results and recommendations will certainly be more realistic if during the study all in-house engineering analyses stand the test of comparison with the "real life picture". Since six separate interviews were scheduled - one for each helicopter model type - the plan was to develop a comprehensive and detailed questionnaire, to use it in the first interview, to review the results, and, if warranted, to make revisions before continuing.

The interview forms were designed in four parts. Part 1 included questions of a general nature which were not "hardware" related. Here the names and maintenance experience of persons being interviewed were recorded. The extent of reliance on various types of technical manuals and checklists was established. Inspection crew size and makeup were discussed. Available facilities and equipments were covered. Questions were asked regarding time required for scheduled inspections in terms of aircraft downtime, elapsed productive hours, and productive man-hours. One last item covered in Part 1 was the effects of a combat environment on the scheduled inspection task. Figure 6 depicts Part 1 forms complete with responses typical of those received during interviews. Names of interviewed persons are omitted as promised at the time of interview. This was done to assure as much candidness as possible.

GENERIC COMPONENT CODE 140601 NOMENCLATURE CROSS/HEAD/STAR EST. INSP. MINUTES 40 PAGE 4 OF 56 HELICOPTER MODEL AH-1

WORK UNIT CODE / NOMENCLATURE	FAIL* RATE	PRIMARY FAILURE MODES: CODE	DESCRIPTION	% TOTAL	WHEN DISCOVERED (%): FLT. RED.	SCHED.	ABORT	OTHER	REMARKS	CURRENT INSPECTION REQUIREMENTS & TECHNIQUE
15214	26				35	21	15	28		DAILY: T.R. control installation for
TAIL ROTOR CROSS-		020	WORN, CHAFED, FRAYED	56						security, visually inspect retaining
HEAD ASSEMBLY		503	SUDDEN STOP	10						nuts and bolts to ensure cotterpins
		730	LOOSE	10						are installed and are safetying nuts
		105	LOOSE BOLTS, NUTS, ETC.	8						to bolts.
										INTERMEDIATE: T.R. control installation
										for security.
										PERIODIC: Same as intermediate plus
										check for play in control crosshead.
										-20 TECH. MANUAL: Check control cross-
										head for radial and axial play as
										indication of pitch control tube
										bearing wear or worn threads-dial
										indicator measurement.

*PER 10,000 FLIGHT HOURS

Figure 3. AH-1 Sample Component Data Page.

GENERIC COMPONENT CODE 110108 NOMENCLATURE HORIZONTAL STABILIZER SECTION EST. INSP. MINUTES 4.0 PAGE 1 OF 61 HELICOPTER MODEL UH-1

WORK UNIT CODE / NOMENCLATURE	FAIL* RATE	PRIMARY FAILURE MODES: CODE	DESCRIPTION	% TOTAL	WHEN DISCOVERED (%): FLT RED	SCHED	ABORT	OTHER	REMARKS	CURRENT INSPECTION REQUIREMENTS & TECHNIQUE
1412C00	24				30	44	1	25		DAILY: Elevators for security.
ELEVATOR ASSEMBLY		020	WORN,CHAFED,FRAYED	33						
		127	ADJUST,ALIGN.IMPROPER	14						
		780	BENT,BUCKLED,DENTED	14						
		730	LOOSE	8						
										INTERMEDIATE: Same as daily.
										PERIODIC: Same as daily.
										-20 TECH. MANUAL: Elevators for damage,
										dents and cracks. Support retainer
										brushings for damage and wear. Support
										brackets for loose rivets. Apply
										vertical pressure at outboard end.
										Inspect rivets visually and by hand
										contact for signs of movement.

*PER 10,000 FLIGHT HOURS

Figure 4. UH-1 Sample Component Data Page.

GENERIC COMPONENT CODE 220301 NOMENCLATURE FUEL CONTROL ASSEMBLY EST. INSP. MINUTES 10.0 PAGE 19 OF ____ HELICOPTER MODEL OH-58

WORK UNIT CODE	FAIL* RATE	PRIMARY FAILURE MODES			WHEN DISCOVERED (%)				REMARKS	CURRENT INSPECTION REQUIREMENTS & TECHNIQUE
NOMENCLATURE		CODE	DESCRIPTION	% TOTAL	FLT RED	SCHED	ABORT	OTHER		
22562					11	6	7	76		DAILY: Inspection connections for
MAIN FUEL CONTROL	36	127	ADJUSTMENT IMPROPER	60						damage and security. Fuel nozzle and
		242	FAILED TO FUNCTION	11						lines for security and leaks
		381	LEAKING	10						
		135	BINDING, STUCK, JAMMED	4						
										INTERMEDIATE:
										PERIODIC: Same as above. Check fuel
										control (N1) and power turbine gover-
										or (N2) rigging for proper rigging,
										freedom of operation, and security.
										-20 TECH. MANUAL: Check loose bolts,
										broken or loose connections, security
										of accessories, and fuel and oil leaks.
										If ignition exciter, fuel control,
										governor, or fuel pump has been re-
										moved, visually inspect the gearbox.

*PER 10,000 FLIGHT HOURS

Figure 5. OH-58 Sample Component Data Page.

FIELD SURVEY FORM

HELO MODEL UH-1

INTERVIEW DATE: 13 June 1972

INTERVIEW LOCATION: Hunter Army Airfield

PERSONS INTERVIEWED:

#1 NAME & RANK: CWO John Doe

MILITARY UNIT: "C" Company, 1ST Aircraft Maint. Battalion

DUTY OR FUNCTION: Quality Control Officer

MAINTENANCE EXPERIENCE: 9 years UH-1, 1 year AH-1

#2 NAME & RANK: SFC John Doe

MILITARY UNIT: "C" Company, 1ST Aircraft Maint. Battalion

DUTY OR FUNCTION: Technical Inspector

MAINTENANCE EXPERIENCE: 6 years UH-1, 2 years AH-1

#3 NAME & RANK: SP6 John Doe

MILITARY UNIT: "C" Company, 1ST Aircraft Maint. Battalion

DUTY OR FUNCTION: Technical Inspector

MAINTENANCE EXPERIENCE: 4 years UH-1, 2 years AH-1

Figure 6. Sample Field Survey Form, Part 1 - Sheet 1 of 7.

PUBLICATIONS

1. WHAT DOES THE INSPECTION CREW USE AS A GUIDE DURING INSPECTION?

   - [ ] CHECKLIST (OFFICAL PUBLICATION)
   - [x] LOCALLY PRODUCED SUMMARY SHEET
   - [ ] -20 ORGANIZATIONAL MAINTENANCE MANUAL
   - [ ] TRAINING AND EXPERIENCE
   - [ ] OTHER ______________________

   Note: Discrepancies recorded on 2404 00-13 forms.

2. HOW IS THE CHECKLIST USED?

   - [ ] CARRIED IN HAND DURING INSPECTION
   - [ ] REFERRED TO TO JOG MEMORY
   - [x] ONE TIME USE TO FORM BASIS OF SUMMARY SHEETS
   - [ ] OTHER ______________________

3. HOW OFTEN IS THE -20 MAINTENANCE MANUAL REFERRED TO?

   - [ ] FOR EACH ITEM MENTIONED IN CHECKLIST
   - [x] FOR OCCASIONAL ITEMS
   - [ ] NEVER
   - [ ] OTHER ______________________

   Note: Primarily for tolerances, torques, etc.

4. TO WHAT EXTENT IS THE -20 MAINTENANCE MANUAL USED?

   - [ ] ALL INSPECTION, TEST, OPERATIONAL CHECK, ETC. INTRUCTIONS FOR PARTICULAR COMPONENT ARE FOLLOWED
   - [ ] ONLY THOSE INSTRUCTIONS THAT MATCH THE REQUIREMENTS OF THE CHECKLIST ARE USED
   - [x] INSPECTOR USES HIS DISCRETION
   - [ ] OTHER ______________________

Figure 6. Sample Field Survey Form, Part 1 - Sheet 2 of 7.

5. IF CHECKLIST AND/OR -20 MAINTENANCE MANUAL ARE NOT CARRIED IN HAND AND FOLLOWED TO THE LETTER, HOW DO INSPECTORS BECOME AWARE OF REVISIONS TO REQUIREMENTS AND/OR PROCEDURES?

- [X] WRITTEN NOTICE CIRCULATED OR POSTED
- [X] VERBAL NOTICE GIVEN BY SUPERVISOR
- [ ] LOCALLY PRODUCED SUMMARY SHEETS REVISED (IF USED)
- [ ] PERIODICALLY REVIEW CHECKLIST AND/OR -20 MANUAL
- [ ] OTHER ______________________________

6. TO WHAT EXTENT DO INDIVIDUAL INSPECTORS USE THEIR TECHNICAL SCHOOL TRAINING AND CLASSROOM NOTES?

- [ ] ALMOST EXCLUSIVELY
- [ ] MODERATELY
- [X] VERY LITTLE
- [ ] OTHER ______________________________

ORGANIZATION

1. TYPICALLY, WHO IS THE SUPERVISOR OF A PERIODIC INSPECTION CREW?

- [ ] CREW CHIEF OF HELO
- [ ] INSPECTION SPECIALIST WITH SUPERVISORY TRAINING
- [X] MAINTENANCE SPECIALIST WITH SUPERVISORY TRAINING
- [ ] OTHER ______________________________

Figure 6. Sample Field Survey Form, Part 1 - Sheet 3 of 7.

2. WHAT IS THE NORMAL CREW SIZE AND WHAT ARE THEIR MOS's?

M.O.S.		Full-Time Men		Part-Time Men	
No.	Title	Authorized	Actual	Authorized	Actual
67_20	Helo Repairman		4-5		
35K20	Avionics Mechanic				
68F20	Aircraft Electrician				
68G20	Airframe Repairman				
68E20	A/C Rotor & Prop. Repairman				
68B20	A/C Turbine Eng. Repairman				
68D20	A/C Powertrain Repairman				
68H20	A/C Hydraulics Repairman				
67W20	Helo Technical Inspector		1		
67W40	Senior Technical Inspector				1
67_40	Maintenance NCO		1		
68Q40	Sheet Metal Tech. Inspector				1

3. DO FULL-TIME CREW MEMBERS WITH SAME MOS's SPECIALIZE IN DIFFERENT AREAS OR SYSTEMS OF HELO?

- ☐ YES
- ☒ NO
- ☐ OTHER ______

4. IN YOUR ESTIMATION, WHAT IS THE ADEQUACY OF THE SIZE OF THE ACTUAL CREW, AND WHY?

- ☒ SATISFACTORY
- ☐ TOO SMALL BECAUSE
  - ☐ EXCESSIVE HELO DOWNTIME
  - ☐ SKILLS NOT VARIED ENOUGH
  - ☐ OTHER ______
- ☐ TOO LARGE BECAUSE
  - ☐ CANNOT EFFICIENTLY USE AVAILABLE MANPOWER
  - ☐ DIFFICULT TO SUPERVISE
  - ☐ OTHER ______

Figure 6. Sample Field Survey Form, Part 1 - Sheet 4 of 7.

TO WHAT EXTENT DO DS AND GS PERSONNEL BECOME INVOLVED IN SCHEDULED INSPECTION?

- ☐ COMPRISE 20% OF TOTAL MAN-HOURS
- ☐ COMPRISE 40% OF TOTAL MAN-HOURS
- ☐ COMPRISE 60% OF TOTAL MAN-HOURS
- ☐ COMPRISE 80% OF TOTAL MAN-HOURS
- ☐ COMPRISE 100% OF TOTAL MAN-HOURS
- ☒ OTHER Majority of P.E.'s completed without much DS or GS assistance.

FACILITIES

PERIODIC INSPECTIONS ARE NORMALLY CONDUCTED WITH THE AIRCRAFT LOCATED:

- ☒ IN A LIGHTED, HEATED HANGAR
- ☐ SPECIALLY PREPARED OUTDOOR AREA
- ☐ FLIGHT LINE
- ☐ OTHER ______

HOW IMPORTANT ARE WORK STANDS, LADDERS, HOISTS, ETC. DURING INSPECTION?

LADDERS	☒ NECESSARY	☐ HELPFUL	☐ NOT NEEDED
WORK STANDS	☒ NECESSARY	☐ HELPFUL	☐ NOT NEEDED
HOISTS	☒ NECESSARY	☐ HELPFUL	☐ NOT NEEDED
JACKS	☒ NECESSARY	☐ HELPFUL	☐ NOT NEEDED
TUG AND TOWBAR	☒ NECESSARY	☐ HELPFUL	☐ NOT NEEDED
WASHING FACILITY	☒ NECESSARY	☐ HELPFUL	☐ NOT NEEDED
______	☐ NECESSARY	☐ HELPFUL	☐ NOT NEEDED

GENERALLY, WHAT IS THE AVAILABILITY OF THE ABOVE SUPPORT EQUIPMENT WHICH YOU CONSIDERED NECESSARY?

- ☒ READILY AVAILABLE
- ☐ AVAILABLE MOST OF TIME
- ☐ AVAILABLE SOME TIME
- ☐ SELDOM AVAILABLE
- ☐ OTHER ______

Figure 6. Sample Field Survey Form, Part 1 - Sheet 5 of 7.

TIME

1. ONCE STARTED, IS AN INSPECTION ALWAYS COMPLETED, OR IS THE INSPECTION SOMETIMES INTERRUPTED TO PERMIT OPERATIONAL USE OF THE HELO?

   - [x] ALWAYS COMPLETED
   - [ ] OFTEN INTERRUPTED
   - [ ] SELDOM INTERRUPTED
   - [ ] OTHER ______________________

2. WITH A PARTICULAR AIRCRAFT, IS THE PERIODIC INSPECTION CONDUCTED AROUND THE CLOCK, ON A TWO SHIFT, OR A THREE SHIFT BASIS?

☐ ONE SHIFT BASIS	-	☒ 1ST	☐ 2ND	☐ 3RD
☒ TWO SHIFT BASIS	-	☐ 1ST	☐ 2ND	☐ 3RD
☐ THREE SHIFT BASIS	-	☐ 1ST	☐ 2ND	☐ 3RD
☐ OTHER ______________________				

3. WITH A NORMAL CREW, WHAT IS THE AVERAGE TIME FOR PERIODIC INSPECTION?

4 days	HELICOPTER DOWNTIME
28 hrs	ELAPSED PRODUCTIVE HOURS
224 hrs	MAN-HOURS (INSPECTION AND MAINTENANCE)
-	MAN-HOURS (INSPECTION ONLY)

Figure 6. Sample Field Survey Form, Part 1 - Sheet 6 of 7.

OPERATIONAL ENVIRONMENT

1. THE USUAL EFFECTS OF COMBAT OPERATIONS ON SCHEDULED INSPECTIONS ARE:

INSPECTION INTERVAL	☐	STRICTLY OBSERVED
	☐	INCREASED UP TO 10%
	☐	INCREASED MORE THAN 10%
	☒	OTHER up to 10% extension on particular PE, but not on subsequent PE's.
HELO DOWNTIME	☐	SAME
	☐	LONGER
	☒	SHORTER (3 Days vs 4 Days)
INSPECTION MAN-HOURS	☐	SAME
	☒	MORE (300 Hrs vs 224)
	☐	LESS
CREW SIZE	☐	SAME
	☒	LARGER (Included pilot & copilot)
	☐	SMALLER
CREW MOTIVATION	☐	SAME
	☒	GREATER
	☐	LESS
FACILITIES	☐	SAME
	☐	BETTER
	☒	WORSE

Figure 6 . Sample Field Survey Form, Part 1 - Sheet 7 of 7.

Part 2 of the original set of forms dealt in turn with each of the helicopter work areas defined in the respective periodic inspection checklists. TM 55-1520-210-PMP applies in the case of the UH-1. In this portion of the interview an attempt was made to concentrate on one area of the helicopter at a time and to solicit impressions of overall accessibility, visibility, work position and safety. Without delving into details at this time, persons being interviewed were asked to simply identify problem components in each of the work areas.

A problem component was defined as one which required significant inspection man-hours or one which lacked an adequate inspection technique. If the inspector(s) being intervived did not touch upon those components which had previously been analytically selected as likely problems, the interviewer interjected them into the discussion. No attempt was made, however, to influence the inspector's opinions on these items. Figure 7 shows a typical Part 2 page.

Having identified, by name, the components considered by inspectors to be inspection problems, the interview moved to Part 3. At this point each component was individually discussed in great detail. Information such as time to inspect, failure modes, failure symptoms, inspection technique, technique effectiveness, accessibility, and probability of maintenance-induced failures was sought. An effort was made to elicit suggestions regarding improvements in inspection techniques, access and/or component design. Responses were recorded on a two-page form shown in Figure 3 of this report.

Finally, at the conclusion of the interview, a "top ten problem list" was created. Such a list, pertaining to the UH-1 helicopter, is shown in Figure 9.

It became clear during the first interview that the survey forms required recording of information that was either repetitious, unimportant, or very obvious to begin with. The interest of the person(s) being interviewed waned quickly as the result of devoting so much time to areas they knew through experience were not problem areas. What was needed was a simplified procedure which encouraged identification of problems by the inspector(s) with a minimum of "hand holding" by the interviewer. It was decided therefore to abandon all discussions on the level of work areas and to immediately begin talking on a component basis in the five subsequent interviews.

WORK AREA NO. 1 NOMENCLATURE Nose Area

DEFINITION All surfaces, components, and equipment in nose compartment and on exterior ahead of crew doors.

MAN-HOURS TO INSPECT 2.5

ACCESSIBILITY: ☐ EXCELLENT ☒ FAIR ☐ GOOD ☐ POOR

BECAUSE: Cannot reach all components through the nose door.

SUGGESTED IMPROVEMENTS: 1 - Improve packaging to reduce density, 2 - hinge instrument panel same as old H-13 helicopter.

VISIBILITY: ☐ EXCELLENT ☐ FAIR ☒ GOOD ☐ POOR

BECAUSE:

SUGGESTED IMPROVEMENTS:

WORK POSITION: ☐ EXCELLENT ☒ FAIR ☐ GOOD ☒ POOR

BECAUSE: Difficult to gain access to lines, hoses, wires behind instrument panel.

SUGGESTED IMPROVEMENTS: See #2 above.

SAFETY: ☐ EXCELLENT ☐ FAIR ☒ GOOD ☐ POOR

BECAUSE:

SUGGESTED IMPROVEMENTS:

SIGNIFICANT TIME CONSUMING ITEMS:

COMPONENT	TIME
battery	25 min
lines and hoses	45 min

COMPONENTS LACKING EFFECTIVE INSPECTION TECHNIQUE:

None

Figure 7. Sample Field Survey Form, Part 2.

(SHEET 1 OF 2)

WORK AREA NO. 1 COMPONENT NOMENCLATURE Lines and Hoses MAN-HOURS TO INSPECT .75

FAILURE SYMPTOMS	CURRENT INSPECTION TECHNIQUE		EFFECTIVENESS OF TECHNIQUE		
	DESCRIPTION	TIME	GOOD	POOR	REASON
FAILURE MODE NO. 1 - chafed, kinked, broken strands					
1 - obvious visually	visual and feel	50%	X		
2 -					
FAILURE MODE NO. 2 - leaks					
1 - wet at fittings, clamps, or at sharp bends	visual	50%		X	leaks more obvious when fluid under pressure
2 -					
FAILURE MODE NO. 3					
1 -					
2 -					

Figure 8. Sample Field Survey Form, Part 3 - Sheet 1 of 2.

COMPONENT NOMENCLATURE Lines and Hoses

SHEET 2 OF 2

ACCESSIBILITY: ☐ EXCELLENT ☒ FAIR ☐ GOOD ☐ POOR

☐ MUST REMOVE OTHER COMPONENTS
☐ MUST PARTIALLY DISSASSEMBLE
☐ MUST REMOVE LINES, HARNESS, ETC.
☐ ADJACENT COMPONENTS IN CLOSE PROXIMITY
☒ OTHER - especially difficult behind instrument panel.

PROBABILITY OF INSPECTION INDUCED FAILURE: ☐ SOME ☒ NONE

BECAUSE:

SUGGESTED TECHNIQUE IMPROVEMENTS: Perform "Maintenance Operational Check" (MOC) at start of Periodic Inspection. Have panels removed and check lines for leaks while under pressure.

SUGGESTED DESIGN CHANGES TO IMPROVE INSPECTION:

SUGGESTED ACCESS IMPROVEMENTS: Area behind instrument panel could be made more accessible if panel was hinged and lines were flexible.

FAVORABLE COMMENTS: Inside nose door area, most lines are grouped in only two areas. They are not spread all over as they are in the AH-1 for example.

Figure 8. Sample Field Survey Form, Part 3 - Sheet 2 of 2.

TOP TEN INSPECTION PROBLEMS

1 Tail Rotor Assembly (arbitrary rebalance requirement)

2 Battery (arbitrary discharge - recharge check)

3 Short Shaft Couplings

4 Hydraulic Servo Cylinders

5 Generator Brushes

6 Landing Gear Cross Tubes (spread)

7 Door Jettison Mechanism

8 Engine Air Particle Separator

9 Engine Assembly (especially bearing screens, mag plugs, etc.)

10 Pylon Mounts

Figure 9. Sample Field Survey Form, Part 4.

To ensure complete coverage of the aircraft, however, these interviews centered around the periodic checklist which conveniently lists all components to be inspected. In order to stir everyone intc thinking harder about the analytically selected potential problems, the items listed in Table III, components to be analyzed, were highlighted in the checklist with colored transparent ink.

The new procedure consisted of simply reading down the checklist, dismissing nonproblem items without recording the fact, and pausing for discussion only when a problem component appeared. In these instances, the inspector(s) complaints and recommendations were recorded on a simplified Part 2 form instead of the original Parts 2 and 3. Several samples of this one-page form, containing typical responses, are shown in this report as Figure 10.

Part 1 of the survey form was brought up last in the interview so as not to create a wrong initial impression in the minds of the person(s) being interviewed. When discussed first, one might think that the interview was being conducted to rate one's adherence to published requirements or to judge his efficiency. These were not the reasons for interview, and every effort was made to eliminate defensive thinking. Also, to encourage greater candidness, assurance was given that the names of persons interviewed would not be published.

Information to complete Part 4 of the interview forms, the "Top Ten Inspection Problem" list, was not requested. The list proved to be very subjective in nature in the initial set of interviews.

FIELD INTERVIEW RESULTS

Field interviews of technical inspectors were conducted at three sites, and interview forms (see field survey form samples on pages 37 through 41) were completed for each of the aircraft types. The sites and subject aircraft are tabulated below:

COMPONENT NOMENCLATURE Wheel Bearings

SEQ. NO. 1.24 (CH-54)

PRIMARY FAILURE MODES: (AS DISCOVERED AT P.E.)

1 -	spalling	% OF P.E.'s	negligible
2 -		% OF P.E.'s	
3 -		% OF P.E.'s	
4 -		% OF P.E.'s	

CONDITION CURRENTLY CHECKED FOR AND TECHNIQUE USED:

AVERAGE TIME TO INSPECT (MINUTES) 120 each wheel

Jack helicopter, remove wheel, remove bearing, clean, inspect, lube, reinstall.

DIFFICULTY ENCOUNTERED:

- ☐ ACCESS
- ☒ TIME CONSUMING
- ☐ INADEQUATE TECHNIQUE
- ☒ INDUCED FAILURES

Occasionally reassembly is done wrong by installing seals or retainers reversed or in wrong sequence.

RECOMMENDED IMPROVEMENTS:

- ☐ REDESIGN INSTALLATION
- ☐ REDESIGN COMPONENT
- ☒ NEW INSPECT. TECHNIQUE
- ☐ CHANGE INSPECT. INTERVAL

Bearings are very reliable and really not as critical in helicopters as they are in high-performance-fixed wing aircraft. Suggest PE inspection be limited to jacking wheel and spinning to hear or feel roughness if bearing is bad. Complete inspection of bearings should be accomplished at tire changes.

Figure 10. Sample Field Survey Form, Revised Part 2 - Sheet 1 of 5.

COMPONENT NOMENCLATURE: Starter Generator

SEQ. NO. 4.4 (OH-58)

PRIMARY FAILURE MODES: (AS DISCOVERED AT P.E.)

1 -	worn brushes	% OF P.E.'s 50
2 -		% OF P.E.'s
3 -		% OF P.E.'s
4 -		% OF P.E.'s

CONDITION CURRENTLY CHECKED FOR AND TECHNIQUE USED:

AVERAGE TIME TO INSPECT (MINUTES) 180

Starter generator is part[illegible]lly disassembled to reveal brushes. Brush length is visually [illegible]he[illegible]ked for adequacy using integral index mark as reference.

DIFFICULTY ENCOUNTERED:

- ☐ ACCESS
- ☒ TIME CONSUMING
- ☐ INADEQUATE TECHNIQUE
- ☐ INDUCED FAILURES

RECOMMENDED IMPROVEMENTS:

- ☐ REDESIGN INSTALLATION
- ☒ REDESIGN COMPONENT
- ☐ NEW INSPECT. TECHNIQUE
- ☐ CHANGE INSPECT. INTERVAL

Provide longer life brush and wear indicator which is external to starter generator.

Figure 10. Sample Field Survey Form, Revised Part 2 - Sheet 2 of 5.

COMPONENT NOMENCLATURE Landing Gear Cross Tubes

SEQ. NO. 5.2 (AH-1)

PRIMARY FAILURE MODES: (AS DISCOVERED AT P.E.)

1 -	Spread excessively but only after hard	% OF P.E.'s	0
2 -	landing and then noticed immediately.	% OF P.E.'s	
3 -		% OF P.E.'s	
4 -		% OF P.E.'s	

CONDITION CURRENTLY CHECKED FOR AND TECHNIQUE USED:

AVERAGE TIME TO INSPECT (MINUTES) 90

Jack helicopter
Level helicopter
Use plumb bob and tape measure to check distance from helicopter centerline and to one skid tube and then from one skid tube to the other.

DIFFICULTY ENCOUNTERED:

- ☐ ACCESS
- ☒ TIME CONSUMING
- ☐ INADEQUATE TECHNIQUE
- ☐ INDUCED FAILURES

RECOMMENDED IMPROVEMENTS:

- ☐ REDESIGN INSTALLATION
- ☒ NEW INSPECT. TECHNIQUE
- ☐ REDESIGN COMPONENT
- ☐ CHANGE INSPECT. INTERVAL

Delete requirement to jack helicopter - specify new dimension between skid tubes and measure when weight of helicopter is on landing gear.

Figure 10. Sample Field Survey Form, Revised Part 2 - Sheet 3 of 5.

COMPONENT NOMENCLATURE Canopy Jettison Mechanism

SEQ. NO. 3.12 (AH-1)

PRIMARY FAILURE MODES: (AS DISCOVERED AT P.E.)

1 -	pins corrode	% OF P.E.'s	5
2 -		% OF P.E.'s	
3 -		% OF P.E.'s	
4 -		% OF P.E.'s	

CONDITION CURRENTLY CHECKED FOR AND TECHNIQUE USED:

AVERAGE TIME TO INSPECT (MINUTES) 60

Canopy is functionally checked by going through jettison procedure and then reinstalling.

DIFFICULTY ENCOUNTERED:

- ☐ ACCESS
- ☒ TIME CONSUMING
- ☐ INADEQUATE TECHNIQUE
- ☐ INDUCED FAILURES

To jettison canopy is very easy, but to reinstall is very difficult and time consuming.

RECOMMENDED IMPROVEMENTS:

- ☐ REDESIGN INSTALLATION
- ☒ REDESIGN COMPONENT
- ☐ NEW INSPECT. TECHNIQUE
- ☐ CHANGE INSPECT. INTERVAL

Figure 10. Sample Field Survey Form, Revised Part 2 - Sheet 4 of 5.

COMPONENT NOMENCLATURE Chip Detectors for Engine, Intermediate Gearbox and Tail Rotor Gearbox

SEQ. NO. 10.10, 11.4 11.5 (AH-1)

PRIMARY FAILURE MODES: (AS DISCOVERED AT P.E.)

1 - ________ % OF P.E.'s ________
2 - ________ % OF P.E.'s ________
3 - ________ % OF P.E.'s ________
4 - ________ % OF P.E.'s ________

CONDITION CURRENTLY CHECKED FOR AND TECHNIQUE USED:

AVERAGE TIME TO INSPECT (MINUTES) 15 each

Chip detectors, which are electrically connected to warning lights in cockpit, are removed from their respective component each periodic inspection and visually checked for chips.

DIFFICULTY ENCOUNTERED:

- [ ] ACCESS
- [x] TIME CONSUMING
- [ ] INADEQUATE TECHNIQUE
- [x] INDUCED FAILURES

Chip detectors normally screw into magnesium housings and threads in housings are frequently stripped.

RECOMMENDED IMPROVEMENTS:

- [ ] REDESIGN INSTALLATION
- [ ] REDESIGN COMPONENT
- [x] NEW INSPECT. TECHNIQUE
- [ ] CHANGE INSPECT. INTERVAL

Use ohm meter to make continuity check across mag plug without removing plug from respective component.

Figure 10. Sample Field Survey Form, Revised Part 2 - Sheet 5 of 5.

Hunter Army Air Base (Aviation Maintenance Brigade) UH-1

Fort Hood (1st Cavalry Division) CH-47, OH-58

Fort Eustis (Aircraft Maintenance Training Division) AH-1, CH-54, OH-6

The interview results show influence by the personal views of the individuals interviewed and a relatively small number of personnel could be sampled. Yet, when analyzed, the results present valuable information relative to modifications to the inspection process and to those areas of the aircraft which should be addressed in the next study task, "Design Approaches for Inspection". The paragraphs which follow present an analysis of the results.

Experience Level of Personnel Interviewed

A total of 13 maintenance inspection personnel were interviewed. The aircraft experience recorded for these specialists ranged from 4½ to 16 years. The average experience was 11 years.

Field Survey Form Part 1 Results

Part 1 of the field survey form consisted of general questions which were asked to gain understanding of the site maintenance operation and to gain information relating to publications, organization, facilities, inspection time and operational environment. The following is a summary of the answers to the Part 1 questions.

Publications

Question 1. What does the inspection crew use as a guide during inspection?

Answers: "Checklist" - AH-1, CH-54, OH-6

"Locally Produced Summary Sheet" - UH-1, CH-54 (or checklist), CH-47

"Form DA 2404" (filled in by hand - OH-58).

Question 2: How is the checklist used?

Answers: "Carried in hand during inspection " - CH-54, OH-6

"Referred to to jog memory" - AH-1

"One time use to form basis of summary sheets" - UH-1, CH-47, OH-58

Question 3: How often is the -20 maintenance manual referred to?

Answer: "For occasional items" - all aircraft

Question 4: To what extent is the -20 maintenance manual used?

Answers: "Inspector uses his discretion" - UH-1, CH-54, OH-58, OH-6

"Only those instructions that match the requirements of the checklist are used" - AH-1

"All inspection, test, operational check, etc. Instructions for particular component are followed" - CH-47

Question 5: If checklist and/or -20 maintenance manual are not carried in hand and followed to the letter, how do inspectors become aware of revisions to requirements and/or procedures?

Answers: "Verbal notice given by supervisor" - AH-1, UH-1, OH-58

Written notice circulated or posted" AH-1, UH-1

"TWX" - CH-47

"Is carried in hand" - CH-54, OH-6

Question 6: To what extent do individual inspectors use their technical school training and classroom notes?

Answers: "Very little" - AH-1,UH-1,CH-47,CH-54,OH-58

"Moderately" - OH-6

Organization

Question 1: Typically, who is the supervisor of a periodic inspection crew?

Answers: "Maintenance specialist with supervisory training" - AH-1, UH-1, OH-58

"Inspection specialist with supervisory training" - CH-54, OH-6

"Regular P.E. team with NCO in charge" - CH-47

Question 2: What is the normal crew size and what are their MOS's?

Answers: See Table IV.

Question 3: Do full-time crew members with same MOS's specialize in different areas or systems of Helo?

Answer: "No" - All Aircraft

Question 4: In your estimation, what is the adequacy of the size of the actual crew, and why?

Answers: "Satisfactory" - AH-1, UH-1, CH-47, CH-54, OH-6

"Too small because of excessive helicopter downtime" - OH-58

Question 5: To what extent do DS and GS personnel become involved in scheduled inspection?

Answers: "Comprise 20 percent of total man-hours" - AH-1, CH-47, CH-54, OH-58

"Usually without DS and GS" - UH-1

"Zero" - OH-6

TABLE IV. NORMAL CREW SIZE

M.O.S.		Full-Time Men						Part-Time Men					
Number	Title	AH -1	UH -1	CH -47	CH -54	OH -58	OH -6	AH -1	UH -1	CH -47	CH -54	OH -58	OH -6
67-20	Helo Repairman	5	4-5	4	5	2	2						
35K20	Avionics Mechanic			2				1			2	1	1
68F20	Aircraft Electrician									1	1		
68G20	Airframe Repairman				1			2		1			
68E20	A/C Rotor and Prop Repairman							1		1	1		
68B20	A/C Turbine Eng. Repairman							1		1	2	ON CALL	
68D20	A/C Powertain Rprman									1	1		
68H20	A/C Hydraulics Repairman				1					1			
67W20	Helo Technical Inspector	1		1	1		1						
67W40	Senior Technical Inspector							1	1	1	1		1
67-40	Maintenance NCO		1	1				1			1	1	1
68G40	Sheet Metal Tech. Inspector									1			

Facilities

Question 1: Periodic inspections are normally conducted with the aircraft located:

Answers: "In a lighted, heated hangar" - AH-1, UH-1, CH-47, CH-54, OH-6

"Specially prepared outdoor area" - AH-1 (weather permitting), CH-47

"In a tent" - OH-58 (at Fort Hood)

Question 2: How important are work stands, ladders, hoists, etc, during inspection:

Answers: Ladders - "Necessary" - UH-1, CH-47
"Not needed" - AH-1, CH-54, OH-58, OH-6

Work Stands - "Necessary" - AH-1, UH-1, CH-47, CH-54, OH-6

"Helpful" - OH-58

Hoists - "Necessary" - UH-1, CH-47, CH-54, OH-6
"Not needed" - AH-1, OH-58

Jacks - "Necessary" - AH-1, UH-1, CH-47, CH-54, OH-6

"Not needed" - OH-58

Tug and Towbar - "Necessary" - UH-1, AH-1, CH-47, OH-58

"Helpful" - CH-54

"Not needed" - OH-6

Washing Facility - "Necessary" - AH-1, UH-1, CH-47, CH-54, OH-58

"Helpful" - OH-6

Other - "Tail rotor blade racks necessary" - AH-1

Question 3: Generally, what is the availability of the above support equipment which you considered necessary?

Answers: "Readily Available" - AH-1, UH-1, CH-47, CH-54, OH-58 (wash rack), OH-6

"Seldom Available" - OH-58 (Tug and Towbar)

Time

Question 1: Once started, is an inspection always completed, or is the inspection sometimes interrupted to permit operational use of the Helo?

Answer: "Always Completed" - All aircraft

Question 2: With a particular aircraft, is the periodic inspection conducted around the clock, on a two shift, or a three shift basis?

Answers: "One Shift Basis - 1st Shift" - AH-1, UH-1, CH-47, CH-54, UH-58

"Two Shift Basis - 1st and 2nd Shift" - OH-6

Question 3: With a normal crew, what is the average time for periodic inspection?

Answers:

	AH-1	UH-1	CH-47	CH-54	OH-58	OH-6
Helicopter Downtime (Days)	3	4	--	10	7	1.5
Elapsed Productive Hrs	24	28	7 Days	64	42	18
Man-Hours (Inspection & Maintenance)	151	224	280	544	150	40
Man-Hours (Inspection Only)	68	--	16	150	75	8

Operational Environment

Question 1: The usual efforts of combat operations on scheduled inspections are:

Answers: Inspection Interval:

"Strictly Observed" - AH-1, CH-47, CH-54, OH-58, OH-6

"Up to 10 percent increase but must make up to next P.E." - UH-1

Helo Downtime:

"Longer" - AH-1 (more damage), CH-54 (due to supply)

"Shorter" - UH-1, CH-47, OH-58, OH-6

Inspection Man-Hours:

"Same" - CH-47, OH-58, OH-6
"More" - AH-1, UH-1, CH-54

Crew Size:

"Same" - AH-1, CH-47, CH-54, OH-6
"Larger" - UH-1, OH-58

Crew Motivation:

"Greater" - All aircraft

Facilities:

"Same" - OH-6
"Worse" - AH-1, UH-1, CH-47, CH-54

Problem Areas by Aircraft Type

Completed Part 2 survey forms for all of the aircraft were analyzed. Suggestions and comments relevant to inspection of aircraft components were reviewed and classified into four categories as follows:

Category A - Improve Component Accessibility
Category B - Redesign Component

Category C - New Inspection Technique
Category D - Change Inspection Interval

Table V presents a matrix summary of problem areas reviewed by the field surveys. Listed vertically are all the components determined in the initial engineering analyses (Table III) plus additional problem areas suggested by the surveys. Coding in the matrix follows the A, B, C, and D categories defined above.

The component listing of Table VI serves to confirm the component listing from the earlier engineering analysis (Table III). Only 15 line items are added, and 8 of these are change of inspection interval. With the exception of the wheel and tire assembly, the other added items reflect specific aircraft design areas of interest.

Table V is a matrix of number of field survey suggestions by classification category and aircraft type.

TABLE V. NUMERICAL FIELD SURVEY SUMMARY

Category	AH-1	UH-1	CH-47	CH-54	OH-58	OH-6	Total
A - Improve Component Accessibility	4	3	12	6	5	2	32
B - Redesign Component	3	10	2	0	5	4	24
C - New Inspection Technique	6	3	1	2	0	0	12
D - Change Inspection Interval	8	7	2	11	3	2	33
Total	21	23	17	19	13	8	101

This matrix indicates that 32 percent of the comments relate to accessibility (installation design for inspection), and a total of 56 percent are areas of suggested future design for improved inspection. These will be considered during the review of

TABLE VI. FIELD SURVEY PROBLEM SUMMARY

Component Code	Nomenclature	AH-1	UH-1	CH-47	CH-54	OH-58	OH-6
110108	Horizontal Stabilizer Section		B				
110201	Sliding Cabin Door		BD				
110603	Tail Boom Attach Fitting						
130103	Landing Gear Cross Tube	C	C				
130201	Landing Gear Shock Strut				A		
130203	Landing Gear Scissors Assembly						
130302	Brake Assembly						
140101	Collective Stick Assembly						
140108	Engine Droop Eliminator Unit						
140201	Cyclic Control Stick						
140301	Controls Mixer Assembly						
140401	Swashplate Assembly		B			B	
140403	Controls Scissors and Sleeve Assembly						
140406	Swashplate Assembly (Heavy Helo)						
140512	T.R. Control Chain Assembly		C				

TABLE VI - Continued

Component Code	Nomenclature	AH-1	UH-1	CH-47	CH-54	OH-58	OH-6
140601	T.R. Cross Head/Star						
150101	M.R. Blade Assembly						
150106	Pitch Varying Housing Assy						C
150108	M.R. Hub Assembly						
150111	Centrifugal Droop Stop Assy						
150117	Stabilizer Bar Assembly						
150122	Pitch Varying House Assy (Heavy Helo)						
150123	M.R. Hub Assembly (Heavy Helo)			D	D		
150201	T.R. Blade Assembly	D	D			D	
150202	T.R. Sleeve & Spindle Assy						
150203	T.R. Hub Assembly	D	D			D	
220100	Engine Assembly	C	A	A C		B	
220301	Fuel Control Assembly	B D		A			
240101	APP Engine Assembly						
240301	APP Fuel Control Assembly						
260101	Engine Drive Shaft		A			A	
260107	Eng/Sync Drive Shaft (Heavy Helo)						

TABLE VI - Continued

Component Code	Nomenclature	AH-1	UH-1	CH-47	CH-54	OH-58	OH-6
260201	T.R./Aux Power Plant Shaft						
260301	Rotor Drive Shaft & Hsg Assy						
260401	Fan Drive Shaft Assembly						
260501	Freewheeling Assembly						B
260503	Aux. Power Plant Shaft Clutch						
260601	Engine Transmission Assembly						
260602	Combining Transmission Assembly						
260603	Main Rotor Transmission Assy	D				A	
260604	Intermediate Gearbox Assembly	C					
260605	Tail Rotor Gearbox Assembly	C					
260606	M.R. Transmission (Hvy Helo)						
260607	Intermediate Gearbox Assy (Heavy Helo)						
260608	T.R. Gearbox Assy (Heavy Helo)						
260802	Pylon Damper Assembly						
290101	Engine Mount			A			
290102	Engine Mount Bearing			A			
290103	Engine Torque Sensor						
290201	Particle Separator Assembly		B				

TABLE VI -Continued

Component Code	Nomenclature	AH-1	UH-1	CH-47	CH-54	OH-58	OH-6
290208	Particle Separator Assembly (Heavy Helo)						
290801	Control Quadrant Assembly						
290803	Throttle Twist Grip Mechanism						
290804	Engine Control Linkage						
290809	Droop Compensator Cam Box						
420108	Inverter						
420206	Battery	D	D	D	D	D	D
420207	Battery Sump Jar						
460101	Fuel Cell			A			
460104	Engine Fuel Purifier						
490601	Cargo Suspension Assembly						
490602	Cargo Hook Assembly						
490607	Hydraulic Winch Assembly						
Group 1	Control Torque Tubes						
Group 2	Cranks/Levers/Arms/Etc.		DD		A		
Group 3	Push-Pull Rods	A	D	A	A		A
Group 4	Control Cables				AD		
Group 5	Electric Fuel and Oil Pumps						

TABLE VI - Continued

Component Code	Nomenclature	AH-1	UH-1	CH-47	CH-54	OH-58	OH-6
Group 6	Gear-Driven Fuel and Oil Pumps		B				
Group 7	Lines and Hoses	AD	C	AAAA	DA	AB	
Group 8	Filters		B				
Group 9	Hydraulic Pumps/Motors	C		A			
Group 10	Hydraulic Cylinders	C	B	A	A		
Group 11	Hydraulic Dampers	D					B
Group 12	Generators	B	B			B	
Group 13	Electric Actuators						
Group 14	Zurn Drive Couplings						
Group 15	Thomas Drive Couplings						
Group 16	Hanger Bearings					A	
Group 17	Door Jettison Mechanisms	B	B	BB		B	
Group 18	Control Force Gradient Assembly						
Group 19	Cooler Blowers						
Group 20	Fire Detection Elements						
220702	Air Bleed Actuator/Strainer	D					
220603	Igniter Plugs	A					
260801	Pylon Mount Assembly		A				
420205	Receptacle				D		

TABLE VI - Continued

Component Code	Nomenclature	AH-1	UH-1	CH-47	CH-54	CH-58	OH-6
130207	Wheel and Tire Assembly				CC		
120106	Inertia Reel				D		
120107	Shoulder Harness/Lap Belt				D		
510100	Flight Indicators Subsystem				D		
120103	Overhead Panel				D		
110604	Landing Gear Fittings				D		D
110605	Cargo Hook Fittings				D		
290302	Inlet Duct/Plenum Chamber					A	
	Tail Boom						B
	Tail Rotor Drive Shaft Mechanical Damper						A
	Transparent Skin Panel						B

design approaches.

Large-Scale Inspection Operations

A United Airlines maintenance base was visited to draw upon their knowledge of large-scale inspection operations. Interesting information was obtained in three areas: airline scheduling, inspection techniques, and personnel skills and training. These areas are reported on below. It was concluded that the airlines operate in a different "world" with respect to many of their inspection operations and inspection problems. They are highly driven by passenger schedules, operating costs, and the profit motive. It is for these reasons that airlines emphasize keeping their aircraft online, expend vast amounts of manpower in a short time (a major overhaul uses 15,000 man-hours in five days), and fly many of their components to failure. Problems which are peculiar to helicopters such as access and rod end bearing wear either do not exist or are not major problems for the airlines.

However, further discussions with airline personnel are warranted in the areas of nondestructive test and inspection aids. They are constantly improving the state of the art in these areas, and a high probability of adaptability of some of their techniques to helicopters exists.

Airline Scheduling of Preventive Maintenance Inspection

The airlines have a far different view of maintenance than the military user does. Essential to the airlines concept is the "fly to failure" theory known in the industry as Condition Monitoring. Condition Monitoring is utilized on almost all components where safety is not a factor. It is a process that requires recording, collecting, and analyzing information and then taking appropriate action. It attempts to get around the problems of preventive maintenance. That is, if you cannot predict failure, you do not gain economically by prefailure maintenance, you do not improve safety or reliability by prefailure maintenance, and therefore you have no basis for any action before failure.

Two other processes are also included in airline maintenance. These are "Hard Time" and "On Condition".

"Hard Time" is another term for time-controlled maintenance

and is a true preventive maintenance process. It involves the identification of a specific time in the life of a component, in advance, without specific examination and the establishment of a positive preventive maintenance action before failure occurs. Maintenance actions can include the full range from remove, discard, and replace, to remove, repair and replace, and also repair in place. "On Condition" is a maintenance process which encompasses those items, components, systems, etc., that exhibit basically a constant failure rate without the distinct knee characteristic of the age-reliability curve of a "Hard Time" component. In addition, these components, either by design, location, or coincidence, permit the use of physical tests and measurements, at regular intervals, to determine the degree of deterioration present and to ascertain whether or not the item can continue to perform to minimums until the next scheduled inspection. If not, then the appropriate preventive maintenance action is performed; if yes, then the item is permitted to continue to age in service until its next scheduled inspection interval is up. A typical airline application will assign 75 percent of the components and systems to "Condition Monitoring", 5 percent to "Hard Time" and 20 percent to "On Condition".

Airline scheduling of inspections is dependent upon conformance with FAA "minimums" and FAA approval of each airline's plans. The document which best discusses inspection guidelines, maintenance programs and maintenance categories is titled Airline/Manufacturer Maintenance Program Planning Document - MSG-2. A good example of an FAA-approved plan is UAL's plan for the DC-8. The table below gives the appropriate name and frequency of the basic inspections.

FAA Equivalent Inspection	UAL Inspection Name	DC-8 Basic Frequency
"A" Check	Terminal Pre-Flight	40 hours
"B" Check	Service Check	200 hours
"C" Check	Maintenance Check	1,400 hours
"D" Check	BCP-Base Check Period	12,000 hours

The unusual part about the airline's method of handling maintenance and inspections is the short turnaround obtained. For example, the BCP inspection (during which many

components are overhauled) takes only five days. During this time, upwards of 15,000 man-hours are expended.

Airline Inspection Techniques

Inspection techniques applied range from simple "look" inspections to tests requiring special internal leakage rate test equipment for the hydraulic system to nondestructive tests (NDT). UAL's Inspection Division employs six types of NDT inspections (both on and off the aircraft):

1. X-ray
2. Isotype
3. Magnetic particle
4. Fluorescent penetrant
5. Ultrasonic
6. Eddy current

Equipment being used includes:

- X-Ray - Picker
- Ultrasonic Immersion Testing - Reflectoscope by Sperry, Ultrasonic "C" Scan by Sperry, Branson Ultrasonic Instruments
- Eddy Current - Magnatest by Magnaflux Corporation, Nortec Scope Display, Harmonic Bond Tester by Shurtronics, Phasemaster by Laser Systems and Electronics Company.

Airline Inspection Personnel Skills

Four labor categories are used by UAL for inspection. They are specialists and supervisors, shop inspectors, lead mechanics, and mechanics. Very few levels of different capability exist in a given labor category. This is due to union influence which pushes for equal training of all individuals in a category. This allows UAL to schedule overtime on an "as needed" basis equally among the people in a given category. UAL's organization for inspection is outlined in Appendix I.

Redesign of Inspection Schedules

Important in the redesign of inspection schedules is the area of the aircraft to be inspected at a given time and the inspection interval. Field survey results include many suggestions for improving checklist procedures and revising inspection intervals. Suggested inspection interval changes resulting from the field surveys tend to confirm the results of the previous analysis of helicopter inspection requirements study since they all are aimed at longer inspection intervals or eliminating inspection items from checklists. These suggestions deserve consideration when existing checklists are reviewed and should be considered when checklists for future aircraft are written. The interval change suggestions are also confirmed by the MAVIS model inspection interval analysis discussed on page 119. A summary of the inspection interval and checklist changes gathered during the field survey is given in Table VII.

TABLE VII. INSPECTION INTERVAL CHANGES		
Component	Aircraft	Recommended Inspection Change
110603 Tail Boom Attach Fitting	UH-1	Increase Interval
150123 M.R. Hub Assembly (Heavy Helo)	CH-47	Increase Interval
150123 M.R. Hub Assembly (Heavy Helo)	CH-54	Delete Oil Pressure Check From P.E. Perform at Daily Only.
150201 T.R. Blade Assembly 150203 T.R. Hub Assembly	AH-1, UH-1, OH-58	Delete Balance Requirement From P.E.
220301 Fuel Control Assembly	AH-1	Check Strainers and Filters Only After Main Filter Found Dirty
260603 Main Rotor Transmission Assembly	AH-1	Delete Lubrication of Mast Splines Except When Scissors and Sleeve is Replaced
420206 Battery	All Aircraft	Delete P.E.Capacity Check but Retain All Other Checks
Group 2 Crank/Levers/Arms	UH-1	Increase Inspection Interval
Group 3 Push-Pull Rods	UH-1	Increase Inspection Interval
Group 7 Lines and Hoses	AH-1, CH-54	Change Inspection of Plastic Pitot Lines to Calendar Time Inspection
Group 11 Hydraulic Dampers	AH-1	Change to Special Inspection After Hard Landings

TABLE VII - Continued

Component	Aircraft	Recommended Inspection Change
220702 Air Bleed Actuator/Strainer	AH-1	Increase Inspection Interval
420205 Receptacle	CH-54	Increase Inspection Interval
120106 Inertial Reel	CH-54	Eliminate from P.E.-Checked on Daily Basis
120107 Shoulder Harness/Lap Belt	CH-54	Same as Previous Item
510100 Flight Indicators Subsystem	CH-54	Same as Previous Item
120103 Overhead Panel	CH-54	Increase Inspection Interval
110604 Landing Gear Fittings	CH-54, OH-6	Increase Inspection Interval
110605 Cargo Hook Fittings	CH-54	Increase Inspection Interval

INSPECTION DESIGN REQUIREMENTS

OBJECTIVES AND PROCEDURES

The second portion of the study had as its goal the identification and recommendation of (1) design approaches which might improve inspection and (2) inspection aid concepts which have promise for improved inspection. This was done through engineering analysis defining the problem areas in design for inspection, the identification of design alternatives for future aircraft, the identification of new inspection aids and techniques and a quantification and validation of the impact of the resulting improved inspection.

The following sections discuss the analysis performed, recommended design and technique approaches for inspection, and the effect of those recommendations.

PROBLEM AREA ANALYSIS

Analysis performed on the field survey data consisted of reduction and consolidation, grouping of related problems, and a breakdown of design approach problems and inspection technique or procedure problems. The goal of this analysis was to provide recommendations for design approaches which might improve inspection and inspection aids or concepts which have promise for improved inspection.

The components listed in Table I on page 8 (high inspection manhours/flight hour components) and those listed in Table VI on page 50 (field survey problem areas) were analyzed and evaluated. This combined list was evaluated in terms of inspection manhours per flight hour, time for individual inspection, failure rates, series -20 technical manual inspection requirements, field survey results, and "when discovered" failure history. Components which turned out to exhibit a reliability problem rather than an inspection problem were eliminated from the analysis. Based on the above considerations, all field survey and initial analysis recommendations for redesigns (component or installation) were limited to a list of 44 components. These were then grouped into areas of problems affecting more than one aircraft model, problems unique to a particular aircraft, or problems where outside vendors would be

consulted. This grouping appears below:

Access Problems

- Back Side of Instrument Panels*
- Pylon Mounts
- Broom Closet and Attic
- Nose Gear
- Lines and Hoses Aft of Aft Transmission*
- Engine Mounts
- Hydraulic Cooler Blower
- Flight Control Connecting Links
- Push-Pull Tubes
- Stick Boost Actuators and Links

Vendor Consultation

- Zurn Coupling Inspection*
- Rod End/Spherical Bearing Inspection*
- Generator Brush Inspection*

Jettisonable Door Reinstallation Problems*

Air Intake Inspection-Induced Failures*

Uniball Inspection (Swashplate, Hydraulic Cylinders)*

Fuel Control Strainers and Filters*

Large Diameter Swashplate Bearing*

Control Cables*

Unique Problems

- Axial play in horizontal stabilizer
- Tail attach fittings and bolts*
- Tail rotor drive shaft
- Crossed engine lines
- Cleaning of double check valve
- Temperature and pressure gages
- Landing gear dampers*
- Overrunning clutch oil level*
- Tail rotor damper fish scale check*

The above grouping was then reviewed for applicability to the goals of:

1. Identification of areas in which design alternatives might offer improvements in the inspection efficiency for future helicopters, and

2. Inspection aid concepts that warrant further study for application to future designs.

Those items marked with an asterisk were selected as applicable to these goals and were subjected to further engineering analysis and vendor consultation.

Solutions were sought not only for the specific aircraft involved but for the general problem areas of the same type applicable to future aircraft.

The field interview results were also reviewed for inspection technique or procedure problems. Fifteen items in this category were listed, including tail rotor hub assemblies, hydraulic controls, oil chip detectors, mast splines, dampers, batteries, landing gear cross tubes, lines and hoses, tail rotor control chains, pitch varying housing assemblies, tail booms, Pitot-static and pressure lines, safety belts and cable reels, wheel bearings, and tail rotor hub and blade assemblies. These items were studied to obtain ideas for the development of inspection aids or concepts that might apply to existing aircraft as well as future designs.

RECOMMENDED DESIGN APPROACHES FOR INSPECTION

This section presents design approaches which are recommended for consideration on future aircraft designs and inspection aid concepts which have promise for improved inspection. The recommendations and suggestions are primarily the result of analysis of problem areas largely found through the field interviews previously discussed. These problems were originally gathered on the specific aircraft the study was concerned with and, as a result, are specific. However, the solutions sought were directed not only at the specific aircraft involved but at the general problem areas of the same type applicable to future aircraft. The solutions are in the form of

suggestions and recommendations based on engineering analysis, field work at AMTD, contacts with component manufacturers, and discussions with USAAMRDL R&M engineers. They have been kept general to maintain their usefulness and applicability to all aircraft. In each case the problem is discussed with reference to a figure excerpted from a specific aircraft's technical manual. It should be noted that these illustrations were used as examples and do not necessarily denote problems requiring solution for these aircraft. Furthermore, they should not be construed as recommendations for retrofit and redesign or regarded as the "best" practical or cost effective solution. The engineering analysis performed did not include actual work with the hardware. Therefore, only engineering judgement was used to measure the solutions for practicality, cost and reliability.

The items discussed in the following recommendation section are:

- Design Approaches

  Rod End Bearing Wear
  Coupling Temperature Detector
  Door Jettison Mechanism
  Generator Brush Inspection
  Instrument Panel Equipment Access
  Engine Intake Assembly
  Tail Boom Attach Fittings and Bolts
  Fuel Control Strainers and Filters
  Control Cables
  Cowling and Fairing Fasteners
  Horizontal Stabilizer Sections
  Oil Chip Detectors

- Inspection Aids and Techniques

  Wheel Bearings
  Control Rod End Bearing
  Tail Rotor Control Chain
  Eddy Current Inspection
  Battery
  Landing Gear Cross Tubes and Dampers
  Tail Rotor Balancing
  Pitch Varying Housing

In addition, several general problems are discussed relative to component access, and a number of desirable built-in maintenance/inspection aids are described.

DESIGN APPROACHES

The following paragraphs describe aircraft component and subsystem design approaches for improved inspectability. The recommendations discussed are those resulting from engineering review of all the problem areas previously defined which are deemed to merit future consideration.

Rod End Bearing Wear

Measurement of rod end bearing wear is often performed by mechanic "feel" while the rod end is installed in the helicopter.

Problem Description

The measurement problem is to detect when allowable wear has been exceeded on rod end bearings. The typical allowable wear is on the order of 0.020 inch to 0.030 inch. The present method of measurement is by "feel" or "shake" while the rod end is installed in the helicopter, which is exceedingly inaccurate, or by dial indicator measurement after the rod end is removed from the helicopter, which is difficult and time consuming.

Recommendation Number One

Design rod ends with a built-in measuring pin to facilitate on-board mechanic measurement. A device for measuring wear is illustrated in Figure 11. A measuring pin is permanently trapped in the bearing outer race. The pin is restricted from moving outward by a shoulder or tapered surface. The pin is restricted from moving inward by the spherical ball. The pin is free to move between these limits. The free motion is greater than the allowable wear. When one end of the pin is in contact with the spherical ball, the other end protrudes above the adjacent outer surface of the rod end bearing. The long axis of the pin coincides with the long axis of the rod end bearing, which is the axis of applied

load and greatest wear. At the time of manufacture, the ball is loaded into intimate contact with its spherical seat on the side opposite the pin. The pin is depressed to contact the spherical ball. The protruding portion of the pin is machined off until the pin height above the adjacent surface is equal to or slightly less than the allowable wear.

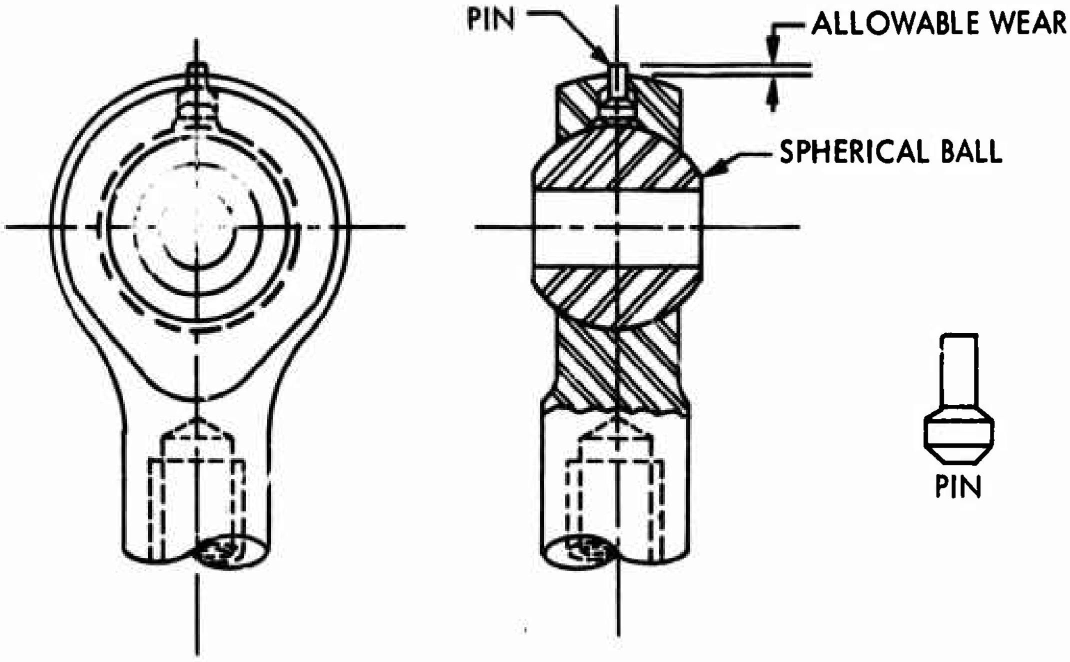


Figure 11. Rod End Bearing Wear Pin Installation.

A mechanic measures rod end bearing wear in the helicopter. The control linkage is loaded in compression so that the ball is forced into intimate contact with the spherical seat on the side opposite the pin. The pin is depressed by the mechanic with his thumbnail, or a steel scale, screwdriver blade or the like. The allowable wear has been exceeded if the pin sinks below the adjacent surface of the rod end.

Measuring Pin Advantages

Several advantages of the built-in measuring pin design approach are noted:

1. Wear can be measured on the helicopter with greater accuracy than present practice.

2. Measurement can be made after simple instruction and does not require skill, training or practice.

3. The measuring device accompanies the rod end and is always ready for use.

4. Wear is measured by feel, so inspection in unlighted areas is not a problem.

5. No change in control system design practice is required by this device.

6. The measuring device does not add weight or significant cost to conventional rod end bearings.

7. The measuring pin can be inspected for ability to function by reversing the load in the helicopter linkage while depressing the pin and observing if the height of the pin changes.

8. Investigation with Army training instructors showed that rod end bearings with this device could be inspected in the most difficult rod end bearing inspection areas on the UH-1, AH-1, OH-6, OH-58 and CH-47 helicopters.

Measuring Pin Design Areas Requiring Investigation

Some areas can be identified at this time that require analytical and experimental investigation. Others may become apparent later. The known areas are discussed briefly below.

The pin and/or the hole may require a chamber to provide space for debris to accumulate if it is found that the pin can give a false reading by resting on an accumulation of material trapped in the pin hole. The protruding pin must be big enough and tough enough not to be easily worn off or broken. The rod end may require a thicker section around the pin hole if the pin hole is found to increase stress beyond acceptable limits. The pin may require a seal to keep corrosive materials from reaching the bearing surfaces.

Recommendation Number Two

The optimum goal in design for inspection of a rod end would be to incorporate in the design a feature which automatically displays a clear and unmistakable indication when an unserviceable state has been reached.

The approach to rod end inspection discussed above falls short of this goal because it is based upon current state of the "design for inspection" art. In contemplating how the art may be extended in the future, several advanced approaches were generated. What follows is a brief description of two similar concepts which are novel but considered to be possible, given adequate development effort.

Some current magazine advertisements beckon the reader to scratch a particular portion of the page and then smell the advertised product, be it cologne, perfume or gin. The surface to be scratched has a film of microscopic capsules containing the advertised product. The same basic principle may be applied to rod ends except that the microscopic capsules would be located below the wear surface and would be impregnated with a vividly colored dye which, when released, would spread to easily visible portions of the rod end. The depth below the wearable, working surface that the dye cells would be placed during manufacture could be variable, contingent upon the "slop" allowed for the respective rod end during service.

Inspection of dye indicator rod ends would be simple and consist of no more than a glance by the mechanic aided perhaps by a flashlight. It may be that colors could be used which would be vivid enough to allow inspection of long lines of controls from a single access point.

An alternate approach to automatic indication of rod end wear employs an integral, miniature battery, a tiny explosive charge, and a supply of colored powder. Electrical conductors buried in the spherical seat of the rod end, when contacted by the uniball after wear occurs, would set off the tiny explosive charge using power from the miniature battery. The charge, in turn, would expel the brilliantly colored powder, marking the rod end

unacceptable for further use.

Use of integral miniature batteries has been demonstrated to be economical by the manufacturers of photographic flash cubes. In the case of aircraft rod ends where reliability is essential, redundant power sources and explosive charges could be used.

Coupling Temperature Detector

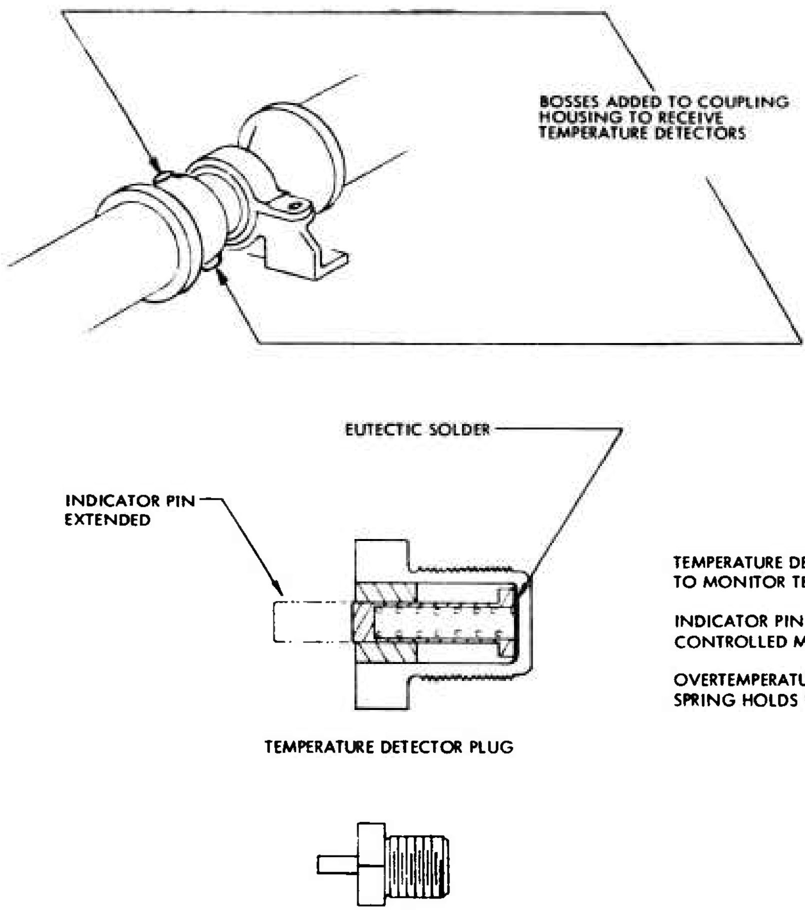
Overtemperature conditions in critical helicopter couplings are a positive indicator of impending failure.

Problem Description

Overtemperature coupling conditions are important to detect on engine, transmission and rotor shafts. For example, the engine drive shaft is disassembled every fourth periodic inspection. This process is required for magnetic particle inspection and is time consuming. Another disassembly problem occurs with the mast splines. This problem is mainly one of lubrication and occurs every periodic inspection interval. Coupling overtemperature conditions usually occur due to binding or a lack of lubrication.

Overtemperature conditions in flexible splined couplings are symptomatic of impending failure due to misalignment, tooth surface breakdown, overtorque, wear, etc. Temperature-sensitive tape has been used as the predominant method of monitoring coupling temperature. This method has not proven to be an entirely satisfactory approach to the problem, however. Consequently, couplings must be removed and disassembled periodically for a visual inspection of condition.

At each disassembly, the couplings must be repacked with lubricant. Because the amount and distribution of the lubricant is critical, either inadequate or excessive lubrication will cause overheating and more rapid wear. The time-consuming disassembly, inspection and lubrication of flexible splined couplings would be required less frequently if a reliable method of monitoring coupling temperature could be provided.



TEMPERATURE DETECTING PLUGS CAN BE INSTALLED IN BOSSES PROVIDED ON SHAFT COUPLINGS, TO MONITOR TEMPERATURE.

INDICATOR PIN IS HELD RETRACTED BY EUTECTIC SOLDER, A MATERIAL WITH A CAREFULLY CONTROLLED MELTING POINT.

OVERTEMPERATURE MELTS SOLDER AND SPRING AND CENTRIFUGAL FORCE EXTENDS INDICATOR PIN. SPRING HOLDS PIN OUT WHEN ROTATION STOPS.

Figure 12 . Coupling Temperature Detector.

Recommendation

The recommended approach involves the design and installation of temperature-detecting plugs in bosses provided on shaft couplings to monitor temperature. Figure 12 illustrates the design of a coupling temperature detector which appears feasible for this application.

Door Jettison Mechanism

Jettison mechanisms are difficult to reinstall after periodic inspection functional checks.

Problem Description

Door or canopy jettison mechanisms are functionally checked at the periodic inspection interval. Most mechanisms include a jettison handle and a cable or mechanical linkage connecting the handle to removable hinge pins. Activation of the handle causes the hinge halves to separate, thus separating the door or canopy from the helicopter. Very few problems are experienced when jettisoning, but reinstalling the door or canopy is often difficult. This is due primarily to the distortion which occurs when the door or canopy is in a free state (not restrained by hinges) and the resultant difficulty in aligning and installing hinge pins.

Recommendation

The functional check of a jettison mechanism is performed only to ensure that the hinge pins can easily be withdrawn. It is not essential that the door or canopy actually leave the helicopter. Figure 13 shows how pin extensions may be utilized to accomplish the above. The pins would be used only during the inspection process and would have large red warning flags attached indicating that removal before flight was mandatory.

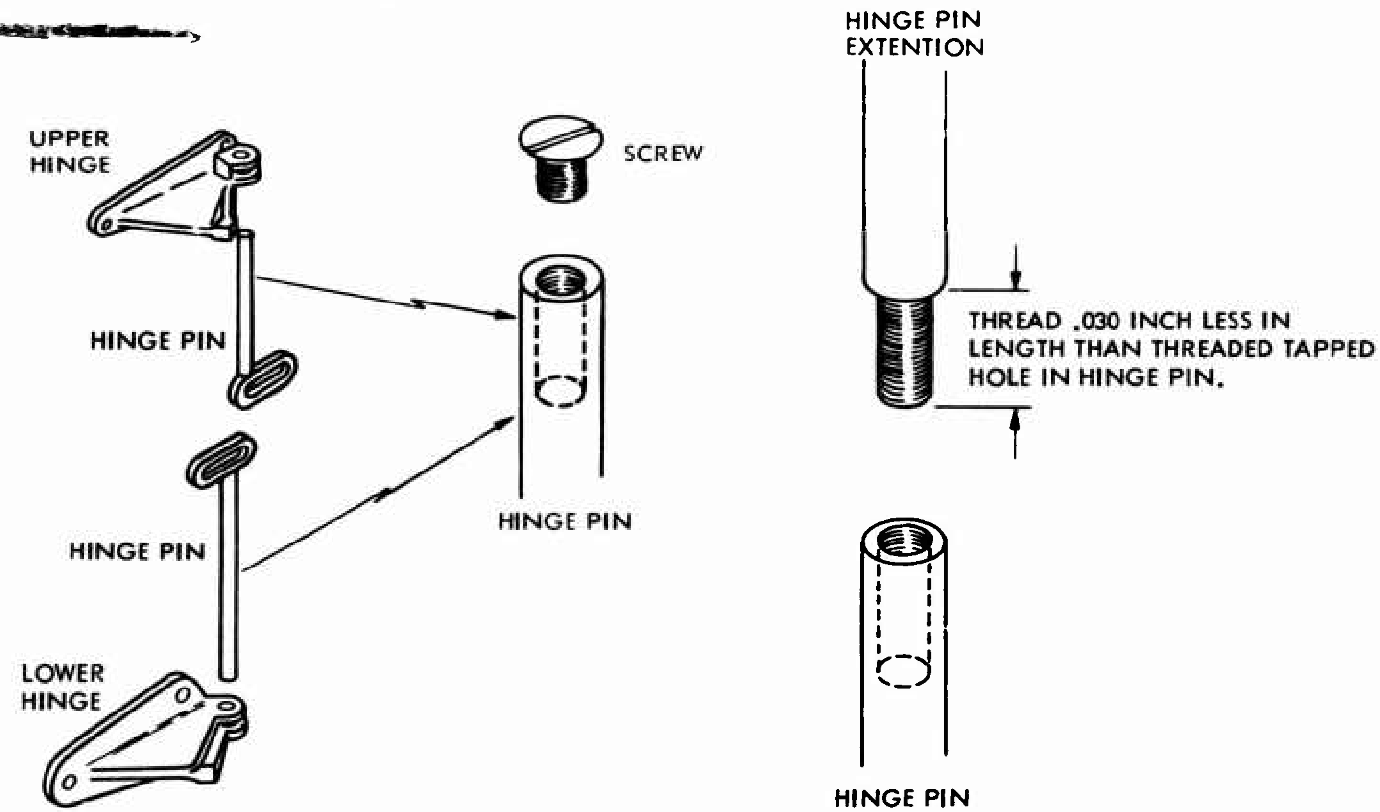


Figure 13 . Door Jettison Mechanism - Hinge Assembly.

Generator Brush Inspection

Generator brushes are difficult to check due to the disassembly required and access problems.

Problem Description

Generator brushes are inspected for wear and freedom of movement in the brush holder. It is time consuming to gain access and then remove the generator blast tubes, blast caps, and brush protective bands to gain access to the brushes themselves.

Recommendations

Several solutions to this problem exist and are detailed below:

1. The simplest solution to the problem, for future design, would be to employ brushless generators. Such machines are almost universally used for aircraft ac systems, and are readily adaptable for use in basic dc systems. It is considered probable, however, that use of the dc starter generators will persist in helicopters for a substantial time because of the weight savings offered, and thus the brush problem cannot be completely legislated out of existence by use of brushless generators.
2. One simple intermediate solution would be to locate a small hole (covered by a snap-button) in the protective band directly over the brush. By removing the snap-button,a soda straw could be inserted (see Figure 14) to touch the top of the brush, and brush length could be determined by determining distance d. Maximum d could be printed on a band adjacent to the access hole.

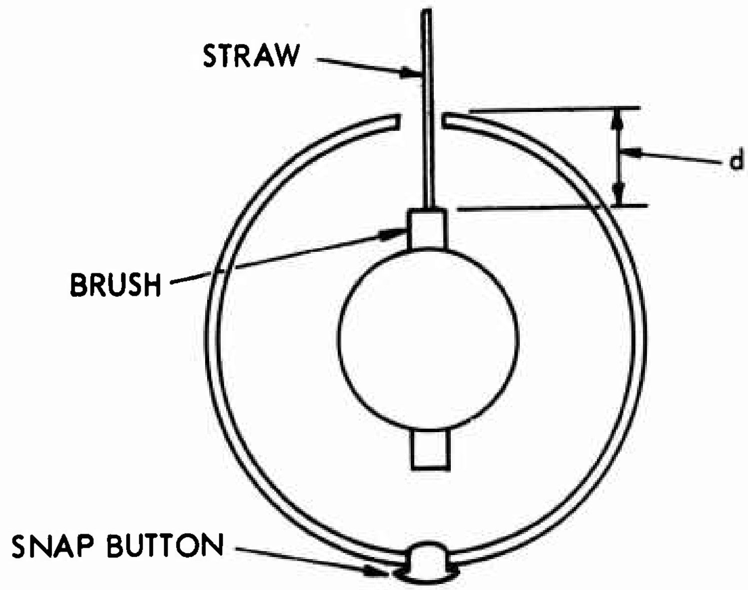


Figure 14. Snap-Button Generator Access.

For this solution to work, obviously:

a. The holes must be accessible.

b. The holes must be directly over the brushes or over some part of the brush holders dimensionally related to the brushes themselves.

To achieve (b), the protective band must be indexed to the body of the generator, which could be done visually, by paint or scratch marks to be aligned on installation, or mechanically by built-in indexing provisions. Accessibility of the holes will vary from one installation to the next; normally the orientation of the generator upon the engine, gearbox, etc., driving it will be largely determined by the terminal block where the wiring is connected. The generator is oriented with the terminal block accessible. The orientation of the brushes with reference to the terminal block could be controlled on future designs (see Figure 15), and access to the holes would become an additional design constraint.

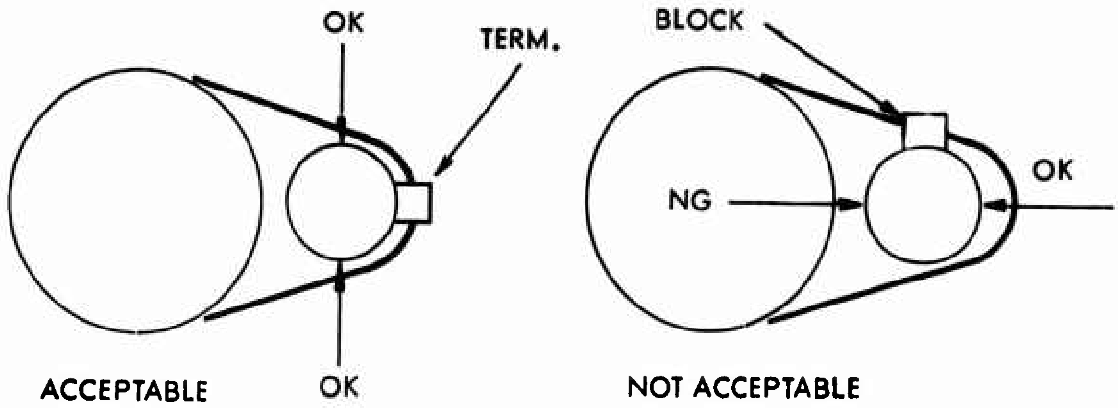


Figure 15. Accessibility of Generator Brush Holes.

3. The same access holes previously mentioned can also be used for visual inspection of commutator condition for oil, particles, etc., by the use of a flexible fiber optics illuminated inspection tool similar to the medical gastroscope. A variety of these commercial devices are available, under various proprietary names, capable of scanning the brush and commutator area of the generator through the small holes.

4. A somewhat more sophisticated approach to determination of brush length is shown in Figure 16. A wire is embedded in the brush itself at the time of manufacture. The wire is completely insulated from the brush electrically, and is led out to a terminal on the generator terminal block. When the permissible wear of the brush is exceeded, the insulation is worn away by the commutator, and the carbon tip of the wire makes contact with the armature of the machine. This can be detected by a simple ohmmeter check performed periodically at the terminal block, or could even be connected to an indicator light if so desired.

The wire could be quite small, so that brush current density was not materially affected by removal of material. The insulation material used would require study to assure that commutator contamination was not caused by the wearing away of minute amounts of insulation.

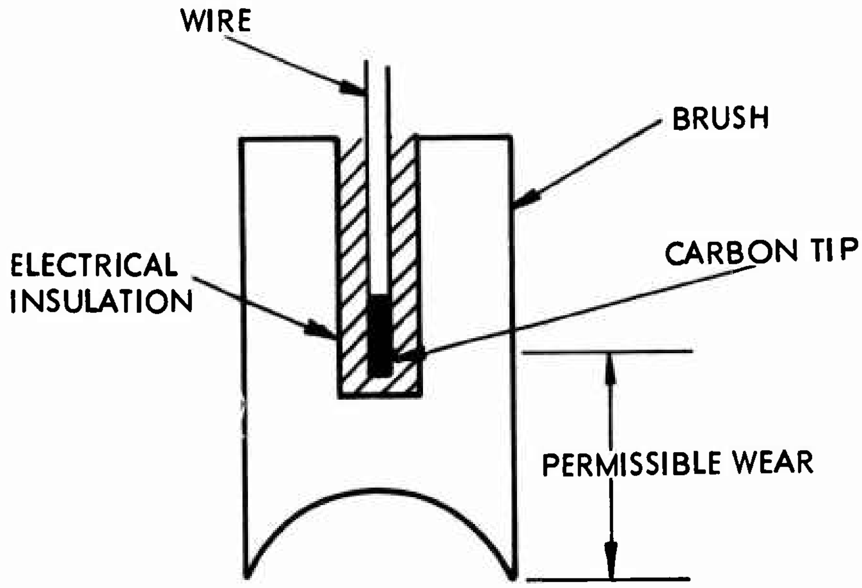


Figure 16. Embedded Wire in Generator Brush.

Instrument Panel Equipment Access

Access to the back side of instrument panels on several aircraft is poor, making inspection time consuming.

Problem Description

Inspection of the instrument panel and its many instruments covers electrical wiring, instrument lines, hoses and fittings. The inspection includes checking for chafed wires and security. Many times, the installation is so cramped that feel is used to supplant visual inspection, forcing the mechanic or inspector to lie on his back or side. Instrument removal and installation are also hampered. Failure history records indicate that 67 percent of the failures in this area are due to missing bolts, clamps, fasteners and parts.

Recommendation

Design the instrument panel to allow hinging down for inspection and maintenance. Installation of Pitot-static lines and instrument cables must also be compatible with this feature. Figure 17 shows a possible hinged instrument panel configuration and lists some of the hinged installation advantages and disadvantages.

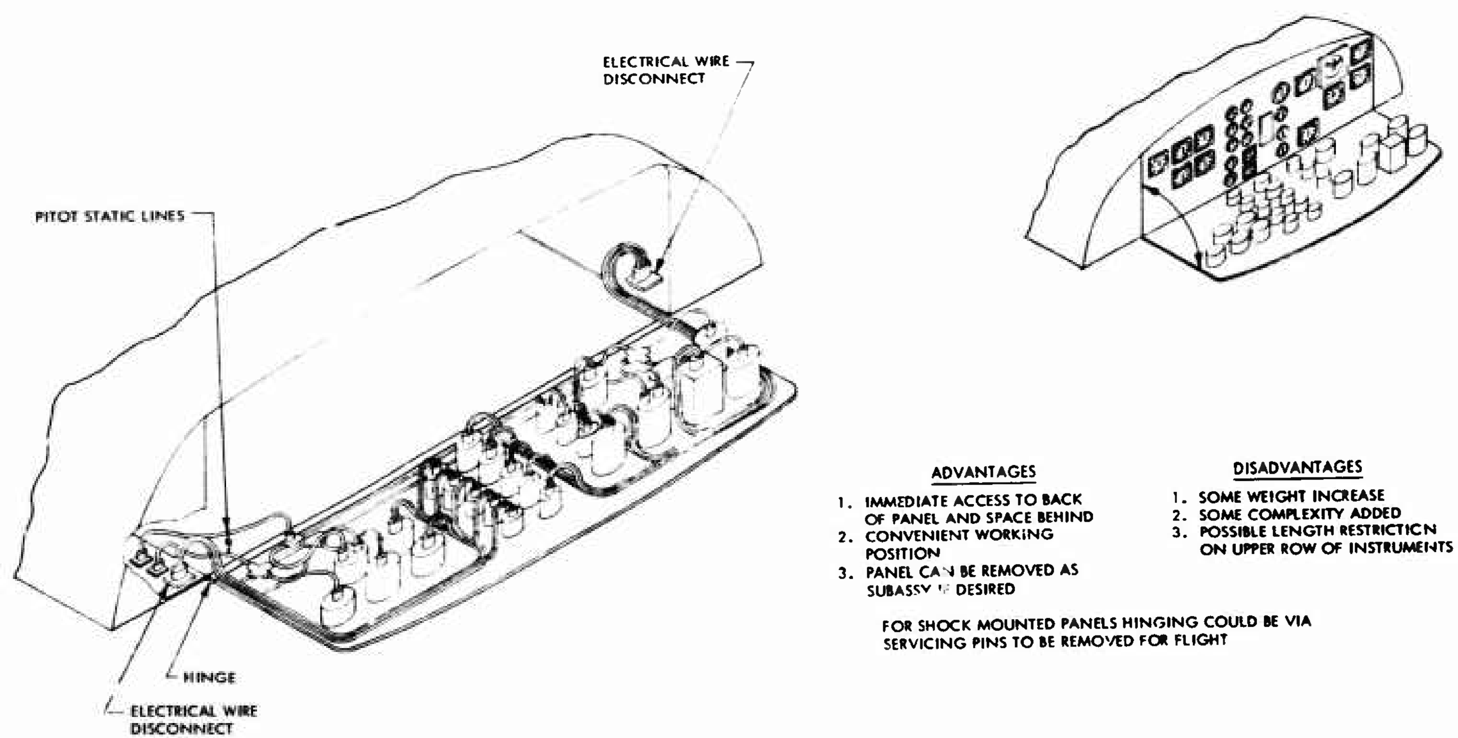


Figure 17. Hinged Instrument Panel.

Engine Intake Assembly

Compressor blades erode and sustain damage from foreign object ingestion.

Problem Description

In most installations, the air particle separator must be disassembled to inspect the compressor. This is both time consuming and a cause of engine damage. Through frequent disassembly, bits and pieces of the separator break off and eventually become ingested by the engine. Figure 18, an extract from TM55-1520-210-34P, illustrates a typical engine intake installation. The numbers in Figure 18 and in similar figures which follow are those which correspond to the parts listing in the technical manual.

Recommendation

Inspection ports in the engine allow inspection of the compressor with a borescope, eliminating the need to disassemble the air particle separator. Figure 19 illustrates a typical filter optic borescope and possible location for a compressor inspection port. This type of feature is being incorporated in some of the newer gas turbine engines.

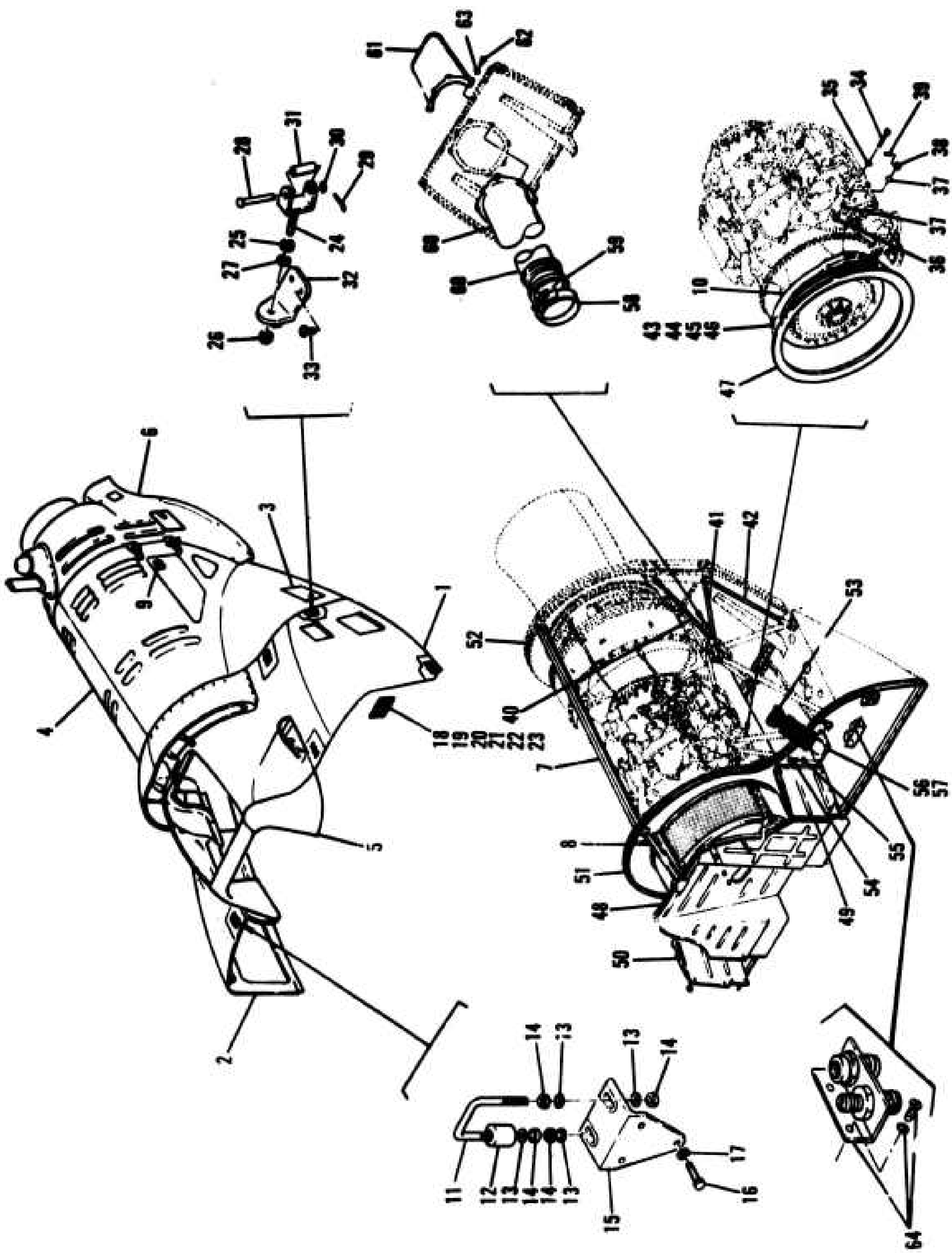


Figure 18. Power Plant Installation.

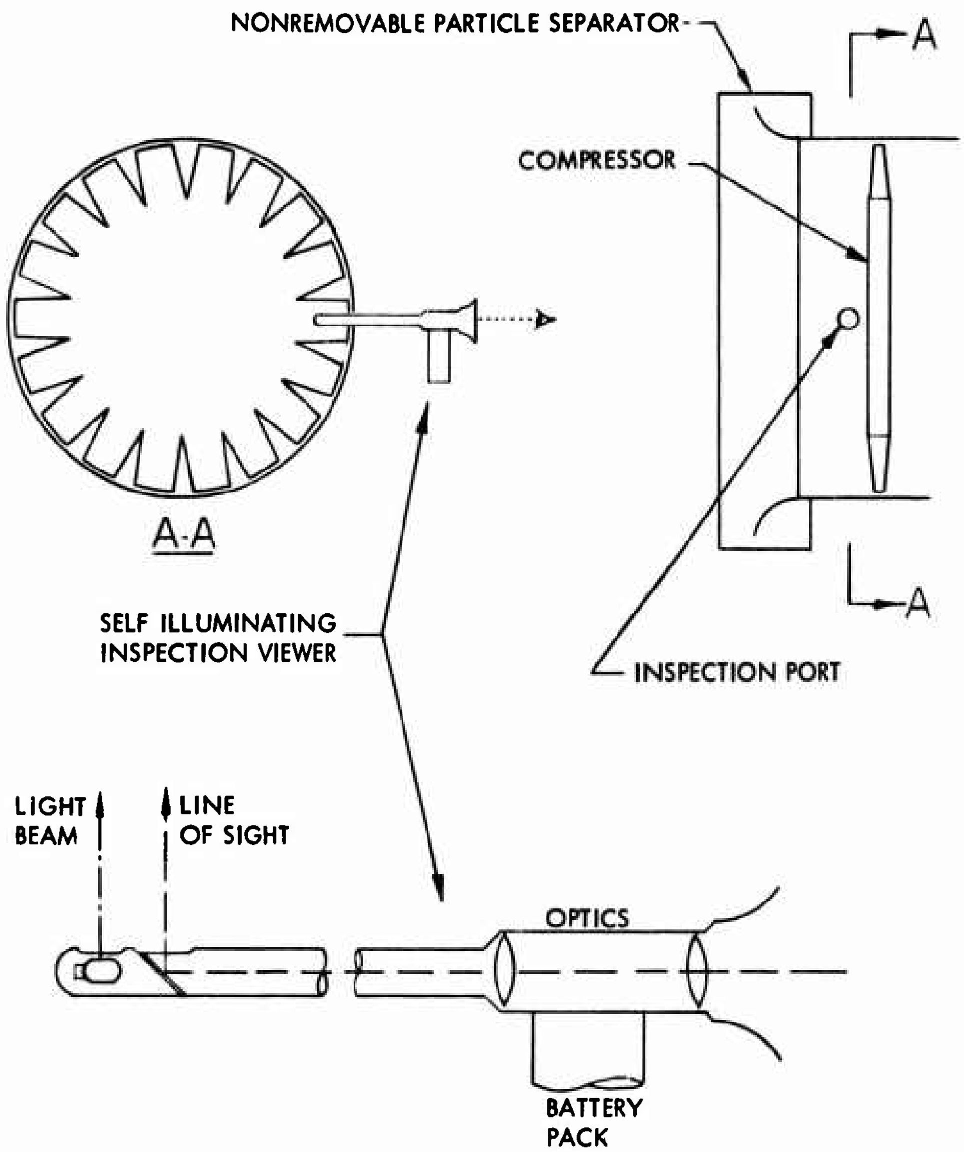


Figure 19. Compressor Blade Inspection Method.

Tail Boom Attach Fittings and Bolts

Inspection of many attach fittings and bolts is time consuming. Difficulty is encountered in determining if movement has occurred.

Problem Description

Tail boom attach bolts must be checked for proper torque. A torque stripe is applied at installation to provide a visual indication of movement between the bolt and fitting for inspection. The current method of applying the torque stripe (usually a match dipped in paint) often produces a "glob" rather than a clearly defined line. At inspection, it is not possible to detect whether movement has occurred, and the bolts must be arbitrarily re-torqued, a time-consuming process. Maintenance history records indicate that 17 percent of the failures are due to loose or damaged bolts, and an additional 17 percent are due to incorrect torque. Figure 20, an extract from TM55-1520-210-20P, illustrates a typical tail boom assembly and some of the fittings involved.

Recommendation

Investigate a device or method for applying a narrow, clear, easy-to-read torque stripe to the tail boom attach bolts and fittings.

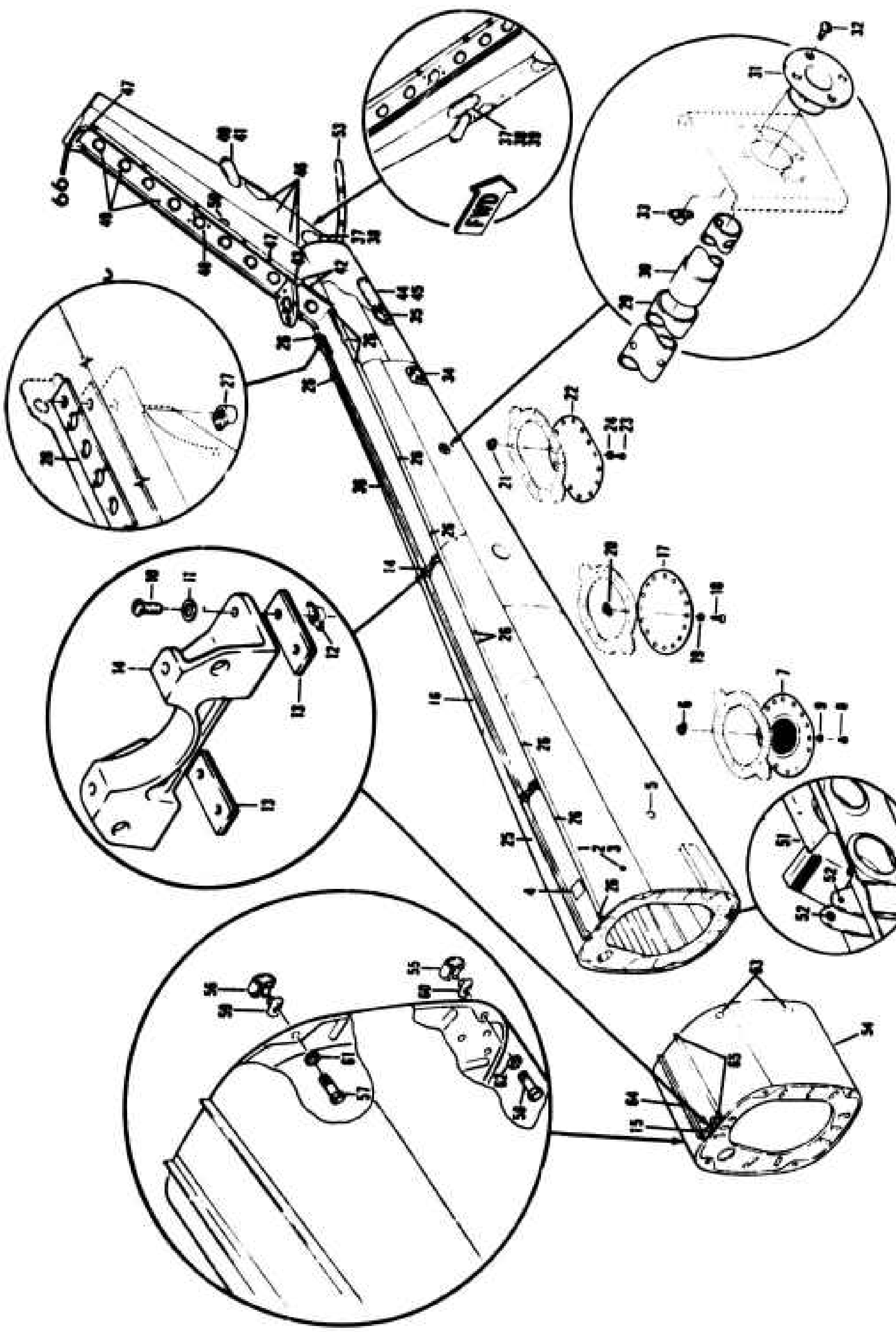


Figure 20. Boom Assembly, Tail.

Fuel Control Strainers and Filters

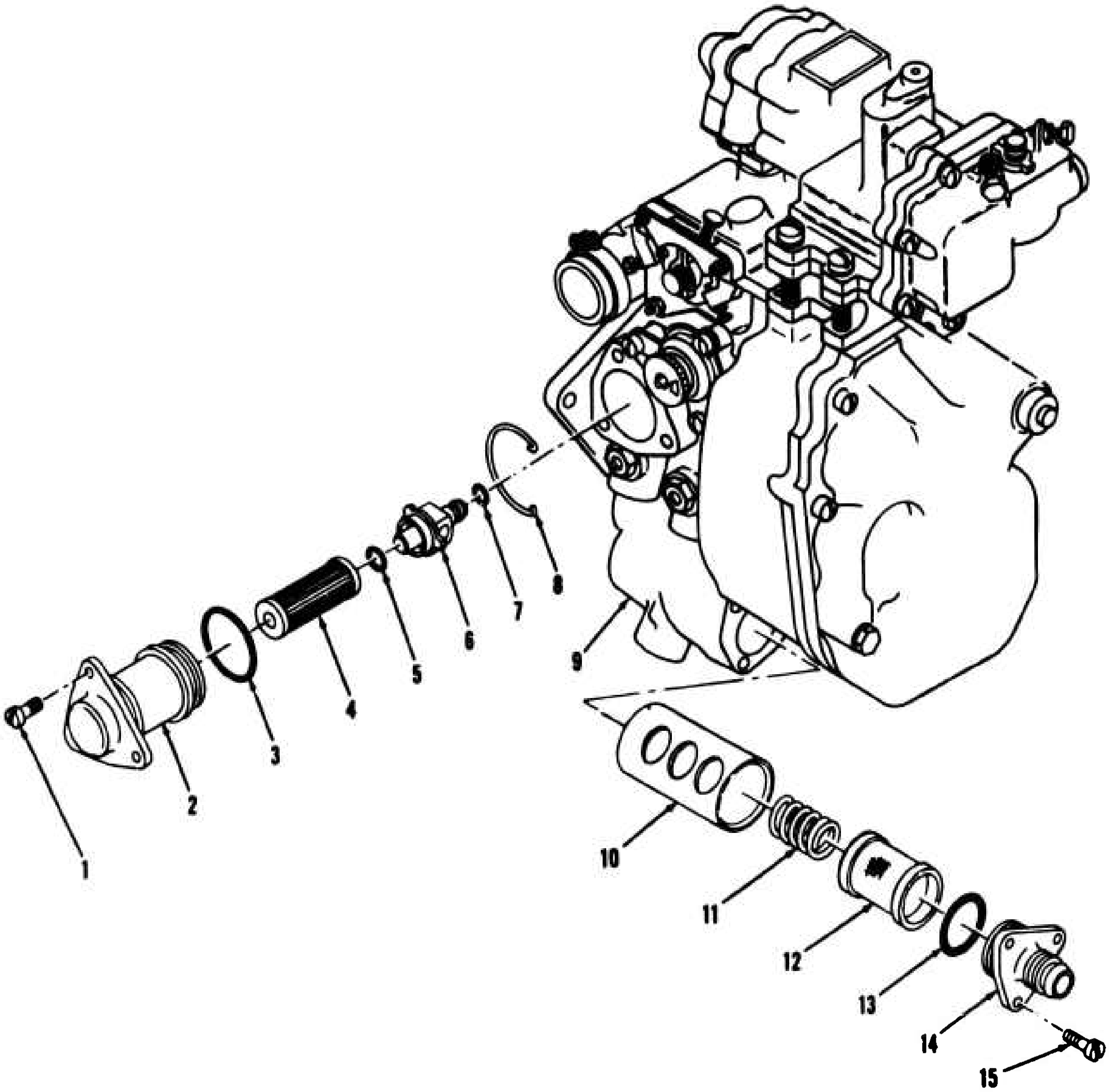
Strainers and filters are sometimes overinspected, difficult to reach, and require elaborate safetying.

Problem Description

Inspection of fuel control strainers, in some installations, necessitates removal of safety-wired screws. On one aircraft with twin engines, this task is particularly difficult because the fuel control on one of the two engines is inboard, where access is restricted. Figure 21, an extract from TM55-1520-221-20, illustrates these components and the packing used. Maintenance history records list "broken" as the failure reason for 33 percent of the fuel control strainers and "leaking" as the failure reason for 17 percent of the servo filters.

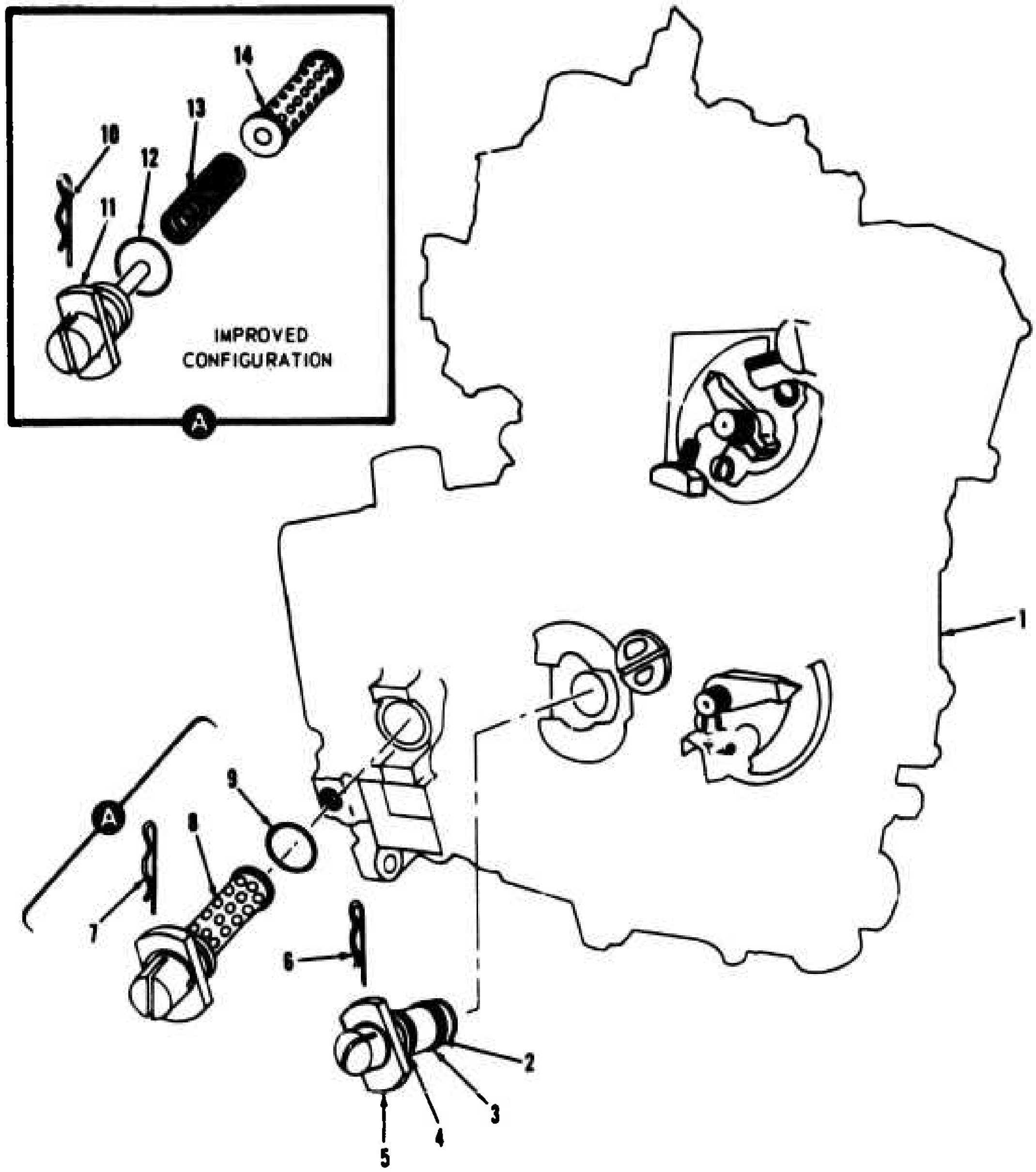
Recommendation

Wider application of bayonet type strainers, and filters now found in some installations, would greatly facilitate the inspection task. These strainers and filters are rotated 90° counterclockwise for removal and 90° clockwise for insertion. Figure 22, an extract from TM55-1520-209-20, illustrates a typical push and turn fuel control filter.



1. Screw
2. Cover and Pump Discharge Strainer
3. Packing
4. Servo Supply Filter Element
5. Packing
6. Filter Housing
7. Packing
8. Retainer Ring
9. Fuel Control
10. Retainer
11. Spring
12. Inlet Strainer
13. Packing
14. Fuel Inlet Fitting
15. Screw

Figure 21. Fuel Control Strainers and Servo Supply Filter.



1. Fuel control unit
2. Packing (MS29513-21)
3. Packing (MS29513-20)
4. Packing (MS29513-19)
5. Control filter
6. Lockpin
7. Lockpin
8. Pump filter
9. Packing (MS29513-19)
10. Lockpin
11. Filter body
12. Packing (MS29513-19)
13. Spring
14. Filter element

Figure 22. Typical Fuel Control Unit Filters.

Control Cables

Tail rotor control cables often fray and require replacement.

Problem Description

Standard control cables are checked for fraying by running a cloth along their entire length. This is a hand operation and is time consuming. The inspection problem is compounded by lack of access to the cable. Figure 23 illustrates a typical tail rotor control cable installation and the lack of access in the tail boom. Maintenance history records indicate 50 percent of the failures occur due to a frayed, chafed or worn condition, while only 11 percent are due to incorrect adjustment.

Recommendation

Require the use of plastic-coated control cables which do not require the time-consuming inspection by feel just described.

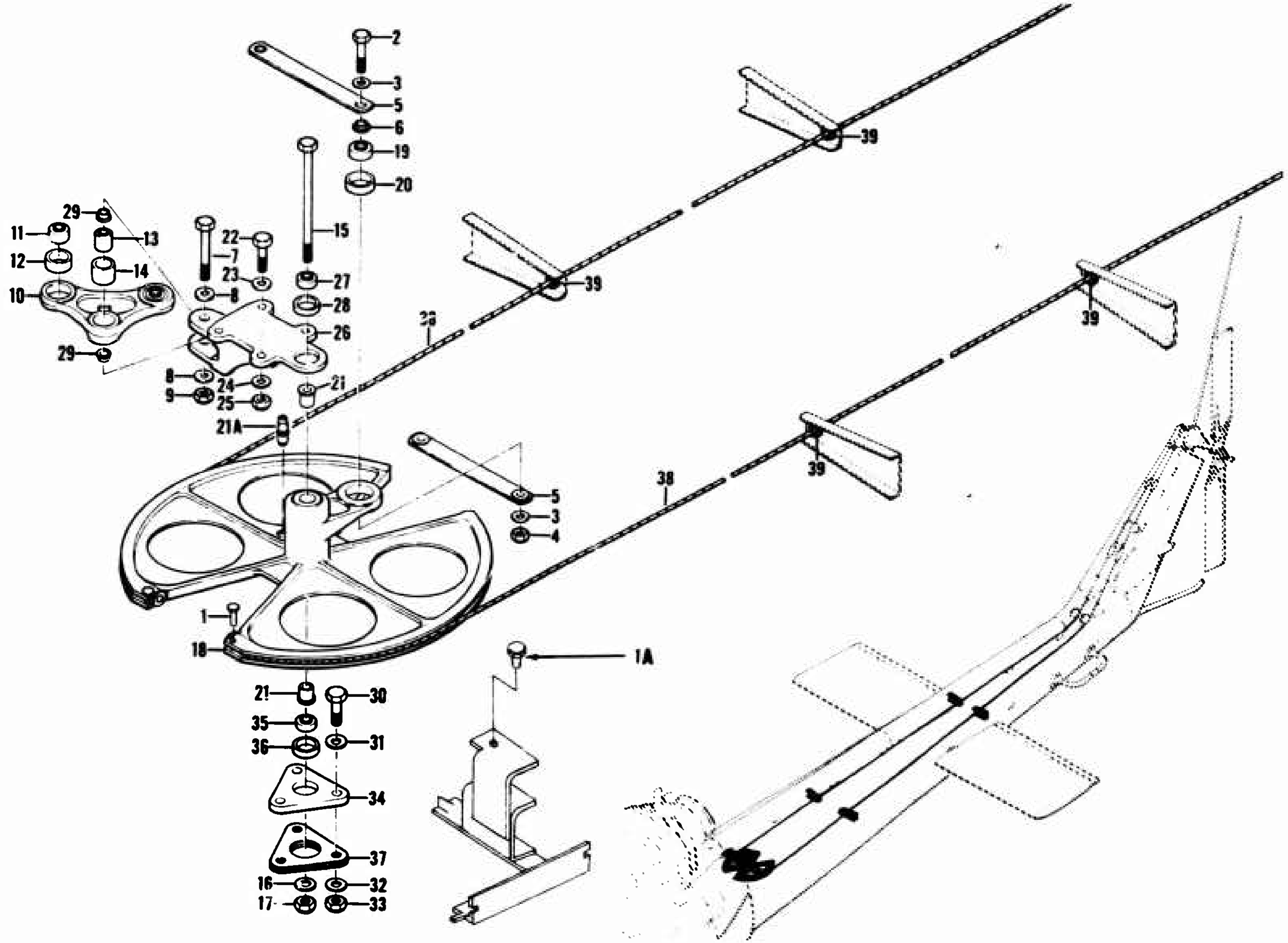


Figure 23. Cable Installation, Tail Rotor Control.

Cowling and Fairing Fasteners

A problem contributing significantly to helicopter inspection time is the attachment of removable cowlings and fairings.

Problem Description

Machine screws used to fasten cowlings and fairings are time consuming to remove and install and strip frequently, creating additional maintenance. Quick-release fasteners are less troublesome, but also suffer mechanical failures. Locating fasteners in areas of poor access contributes to the problem. Maintenance history records show that 24 percent of the failures in this area are due to missing bolts, nuts, screws and fasteners, and 16 percent are due to broken items. Figure 24, extracted from TM55-1520-228-20P, illustrates a typical cowling installation.

Recommendation

Investigate design approaches to cowling and fairing attachment which will permit the use of fewer fasteners and facilitate positive alignment for installation. Insure that access to fasteners does not inhibit operation.

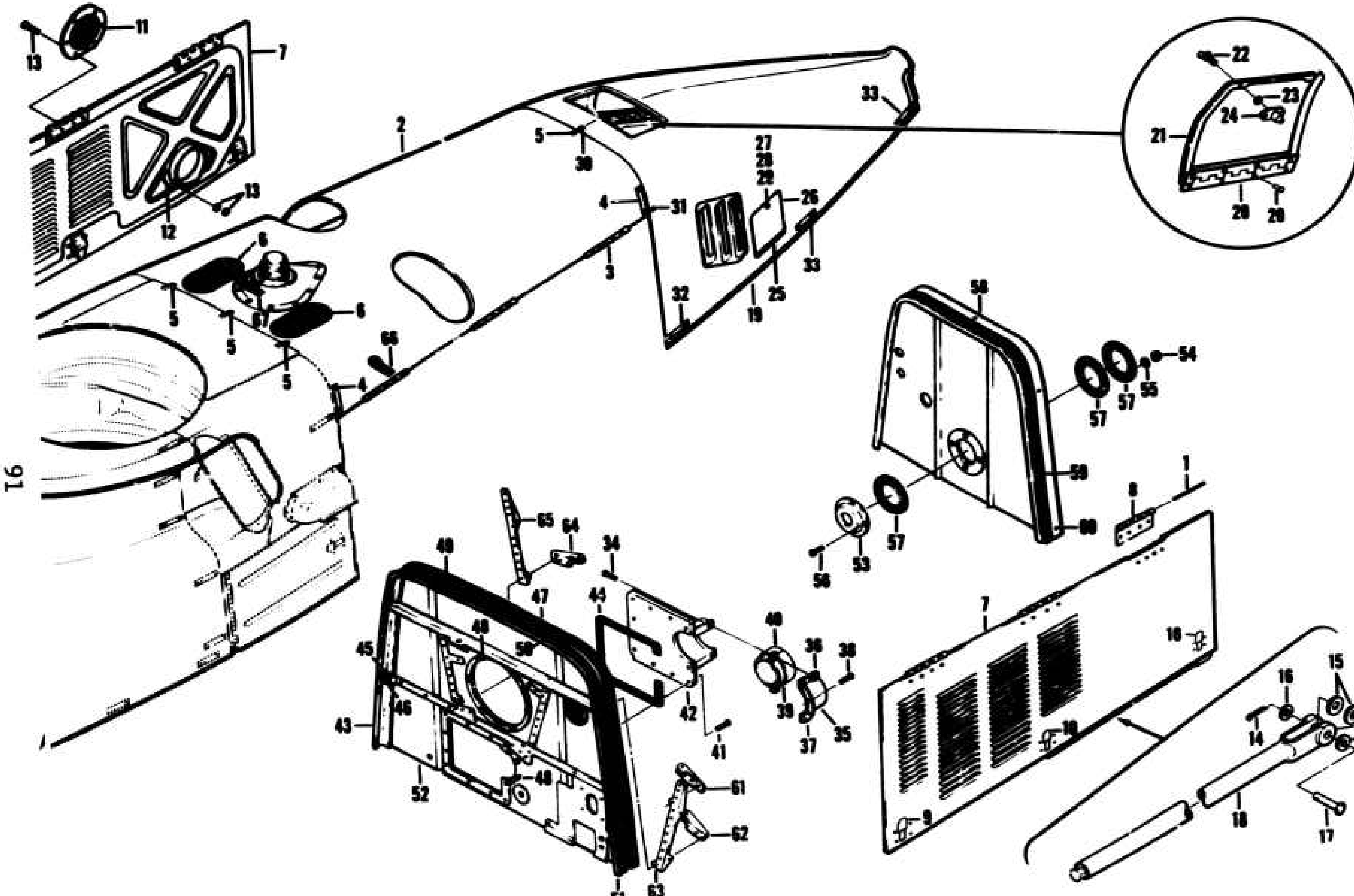


Figure 24. Cowling Installation.

Horizontal Stabilizer Sections (Elevators)

Elevators on some helicopters require frequent inspection for excessive axial shaft play.

Problem Description

A precision dimensional check, using a dial indicator, is required to measure elevator axial play. Allowable tolerance is 0.005 to 0.025 inch. Maintenance history records show this component to fail 33 percent of the time as worn, chafed or frayed and 14 percent of the time for adjustment or alignment improper. Figure 25 is an extract from TM55-1520-210-20P which illustrates the elevator installation.

Recommendation

Fit wave washers on either side of the bearing to eliminate excessive clearance and to take up movement. Inspection methods specified for this component include functional check, static visual check, manual play/clearance check, and precision dimensional check. Fitting of wave washers will allow deletion of manual play/clearance check and the precision dimensional check.

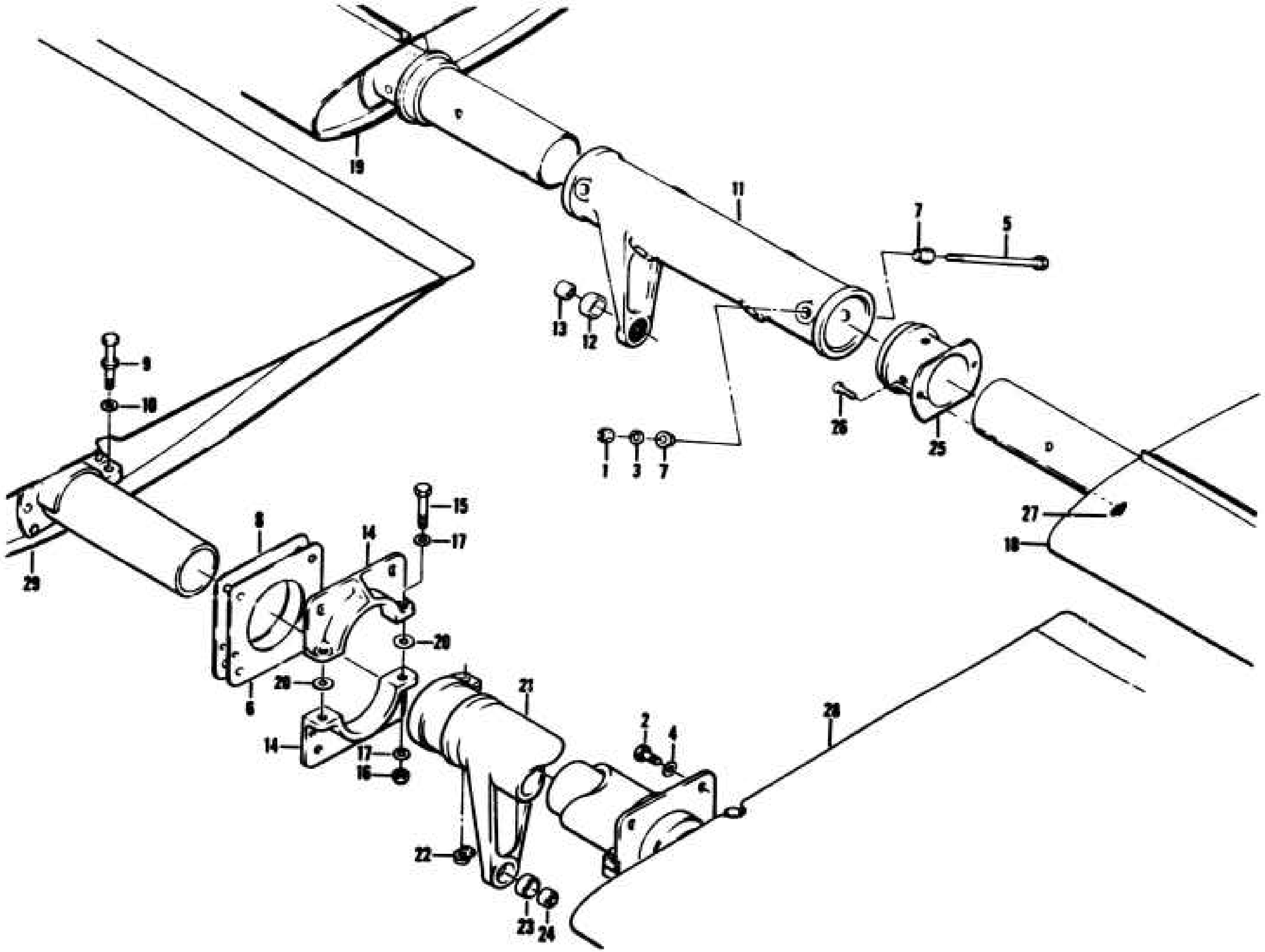


Figure 25. Elevator Installation, Synchronized.

Oil Chip Detectors

Oil chip detectors are usually checked via removal and visual inspection, a time-consuming process that can cause maintenance-induced failures.

Problem Description

The removal and inspection of oil chip detectors in some installations is difficult due to access to their location on the engine and gearboxes. Induced failures occur, as it is possible to strip the plug threads in the housing. The visual inspection is for an accumulation of metal chips or particles. Maintenance history records list the prime failure modes of this component as "broken" (34 percent) and "dirty" (11 percent).

Recommendation

Use of self-closing bayonet-type plugs, now found in some installations, will greatly facilitate the inspection task.

On these self-closing chip detectors, the plug is snapped out by a quick push-and-turn motion, without any tools or lockwire. The valve closes and the chip detector is exposed for visual inspection. Figure 26 illustrates the bayonet-type (quick disconnect) self-closing chip detector in a transmission application.

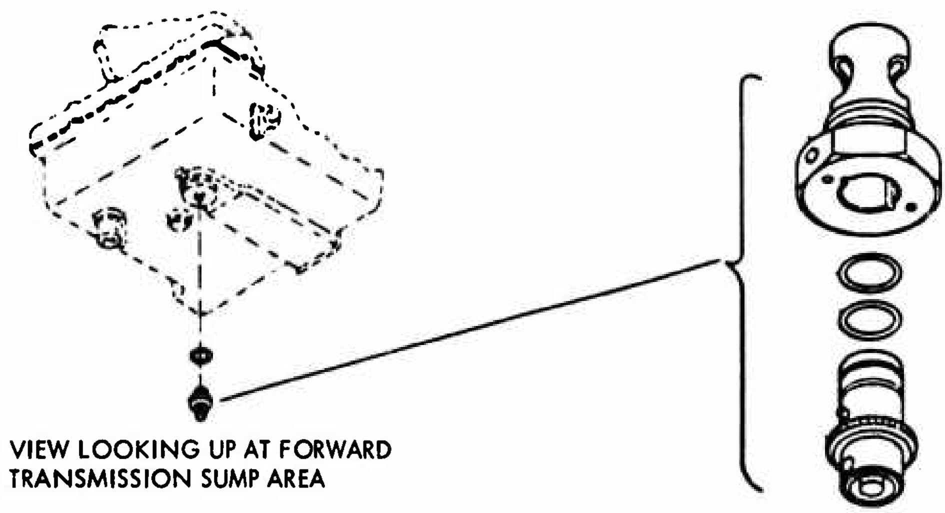


Figure 26. Bayonet-Type Chip Detector, Transmission Installation.

INSPECTION AIDS AND TECHNIQUES

The following are recommendations for improved inspection aids and techniques.

Wheel Bearings

Wheel bearings are being overinspected through an inspection requirement calling for disassembly every periodic interval.

Problem Description

Periodic inspection of the wheels and bearings on large helicopters involves jacking and removing the wheels, and removing, cleaning, visually inspecting, repacking and reinstalling the bearings. This is a critical inspection on high-speed fixed-wing aircraft, but is of less importance on helicopters. Figure 27, an extract from TM55-1520-217-34P, illustrates a typical wheel assembly.

Recommendation

Limit wheel bearing inspection at the periodic interval to jacking the helicopter, spinning the wheel, and listening and feeling for rough bearings. A thorough visual inspection of removed bearings is recommended only at times when the tire is changed or the wheel is otherwise removed. Adoption of this new procedure, aside from saving inspection time, will reduce instances of faulty maintenance such as use of improper lube and/or incorrect reinstallation of bearings, retainers, seals, etc. In some cases, the inspection checklists call for separate (left side, right side) inspections of the wheels. These should be combined for simplicity.

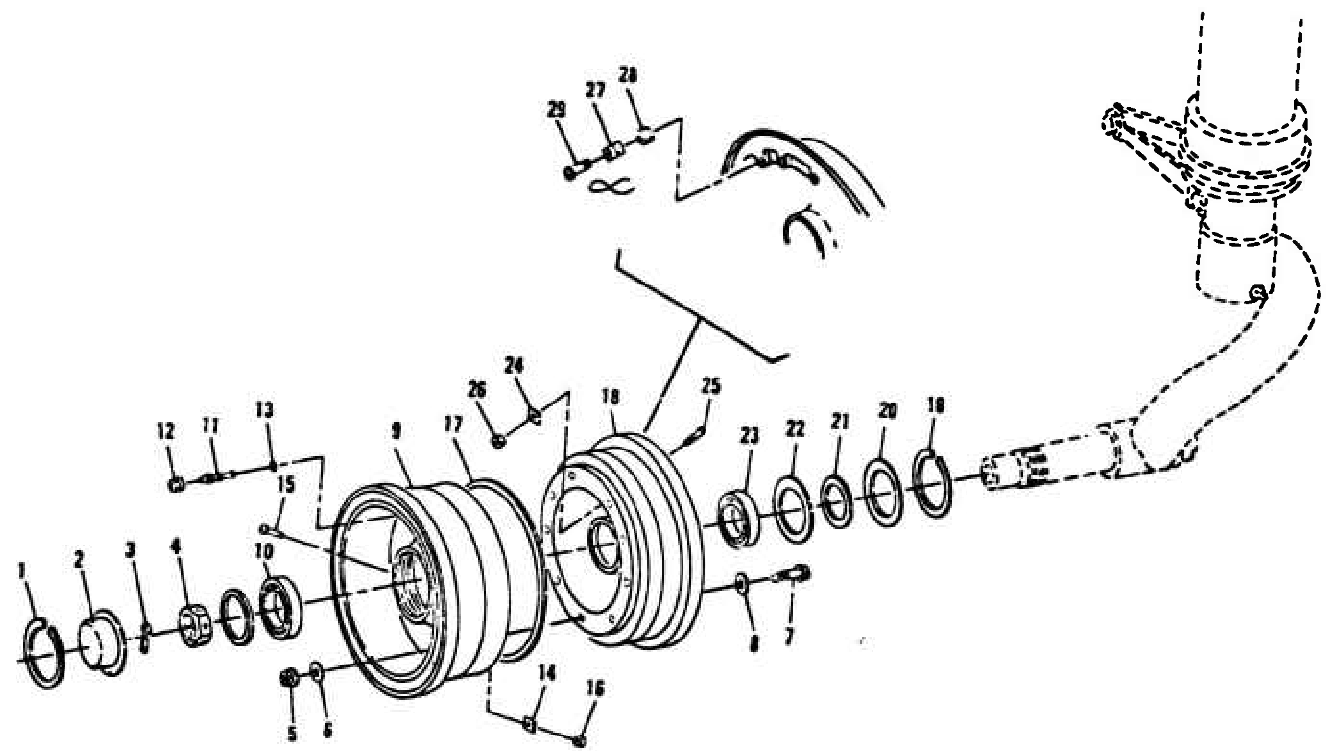


Figure 27. Main Landing Gear Wheel.

Radial Play Check for Rod End Bearings

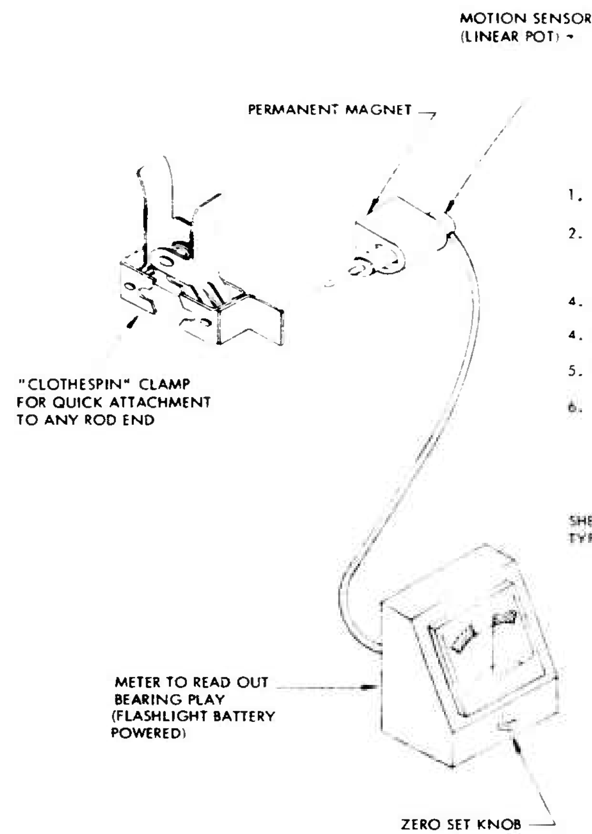
Looseness in rod end bearings is difficult to check using dial indicators due to access problems and space restrictions.

Problem Description

Numerous push-pull rods, cranks, levers, arms, etc., are used in helicopters for flight control and other key linkages. Inspection checklists specify a check of excessive looseness for spherical ball rod end bearings. Many times, it is impossible to use a dial indicator due to restricted space and access problems. Maintenance history records indicate that these items are rejected as being worn or chafed 20 percent to 57 percent of the time and improperly adjusted 18 percent to 35 percent of the time.

Recommendation

One concept which deserves exploration uses a clamp-motion sensor technique where high-precision rod end play measurements are required. Figure 28 (5 sheets) illustrates the equipment required for this technique. It consists of clamp, magnetic linear motion sensor, and readout meter. Sheet 1 of Figure 28 also lists the procedure needed to use this equipment. Sheets 2 through 5 are drawings illustrating this equipment's application to several typical rod-end installations. This technique may be used in areas where dial indicator checks are difficult, and it should provide improved inspection accuracy. It does have the disadvantage of a requirement for more equipment than current procedures.



TO CHECK RADIAL PLAY IN ROD END BEARING:

1. PLACE SENSOR ON HEAD OF BEARING BOLT. PERMANENT MAGNET WILL SECURE IT IN PLACE.
2. CLIP THE "CLOTHESPIN" CLAMP ONTO THE BELLCRANK OR MEMBER FORMING THE OTHER SIDE OF THE JOINT, ASSURING THAT IT HAS SENSOR PLUNGER PARTLY DEPRESSED. PLUNGER HAS .50" AVAILABLE TRAVEL.
4. MANUALLY MOVE JOINT TO TAKE UP ALL PLAY IN ONE DIRECTION.
4. ZERO THE METER WITH KNOB.
5. MANUALLY SHAKE JOINT TO WORK BEARING THRU FULL PLAY.
6. READ OUT BEARING PLAY FROM METER.

SHEETS 2 THRU 5 SHOW SENSOR AND CLOTHESPIN CLAMP IN PLACE ON SEVERAL TYPICAL ROD END INSTALLATIONS

Figure 28. Rod End Bearing Play Sensor (Sheet 1 of 5).

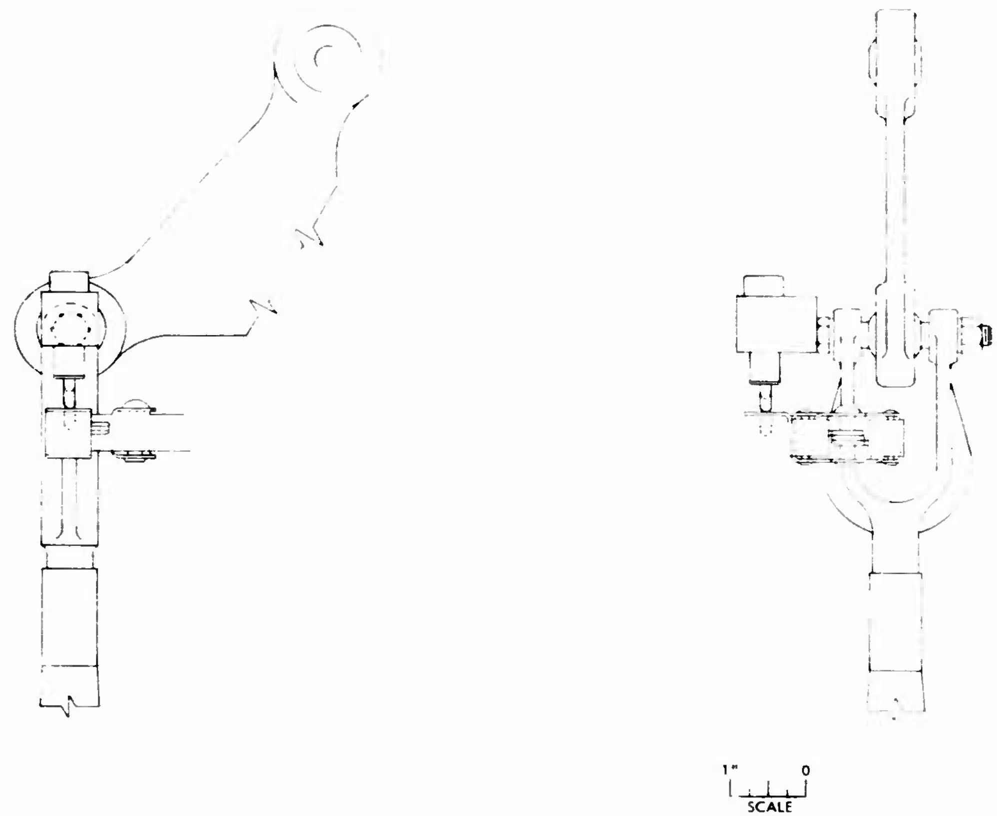


Figure 28. Rod End Bearing Play Sensor (Sheet 2 of 5).

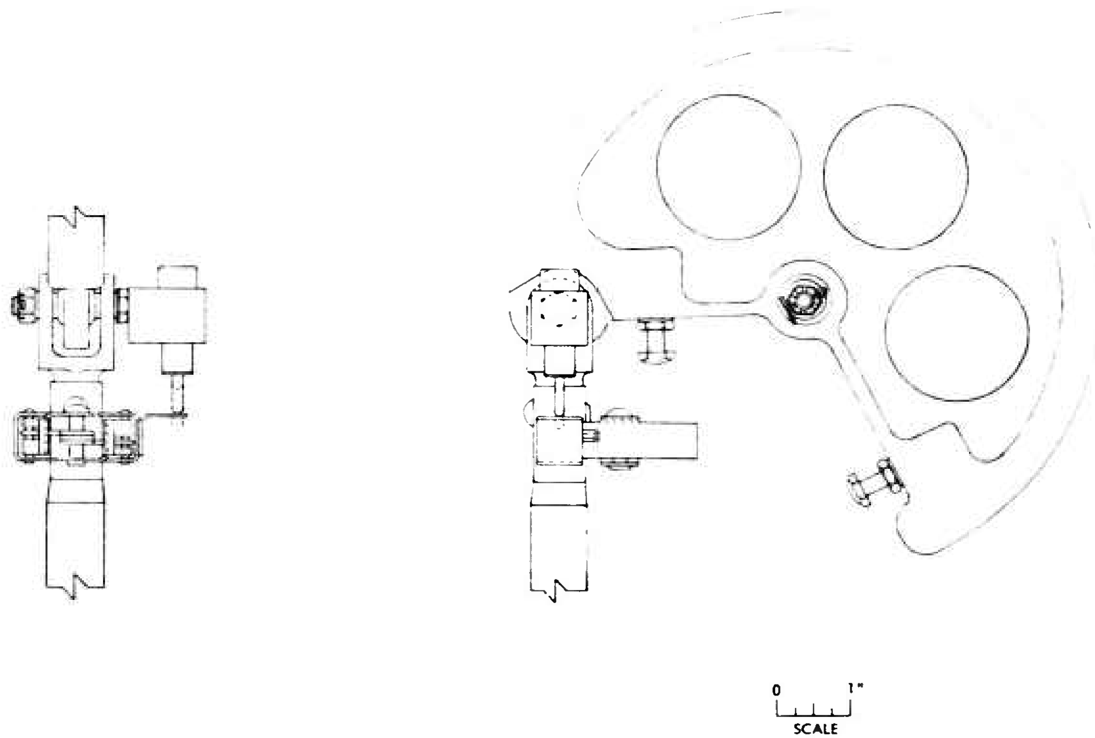


Figure 28. Rod End Bearing Play Sensor (Sheet 3 of 5).

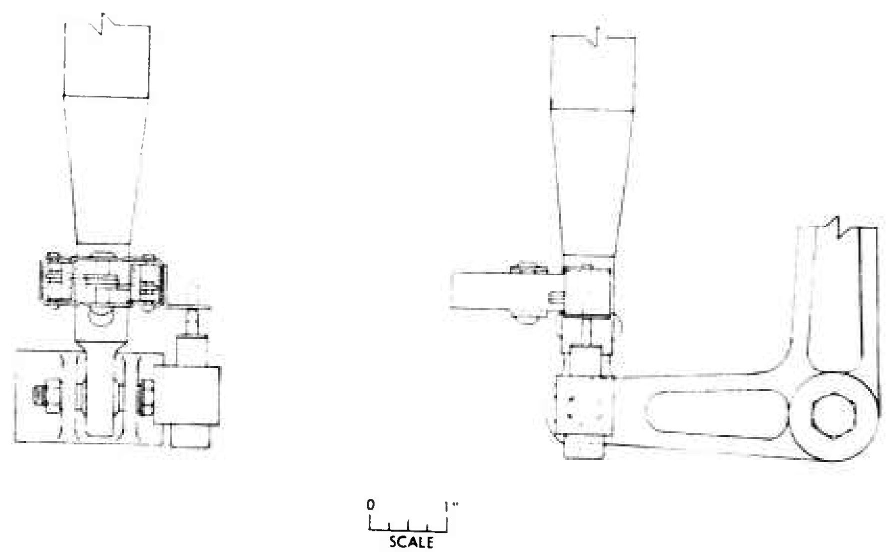


Figure 28. Rod End Bearing Play Sensor (Sheet 4 of 5).

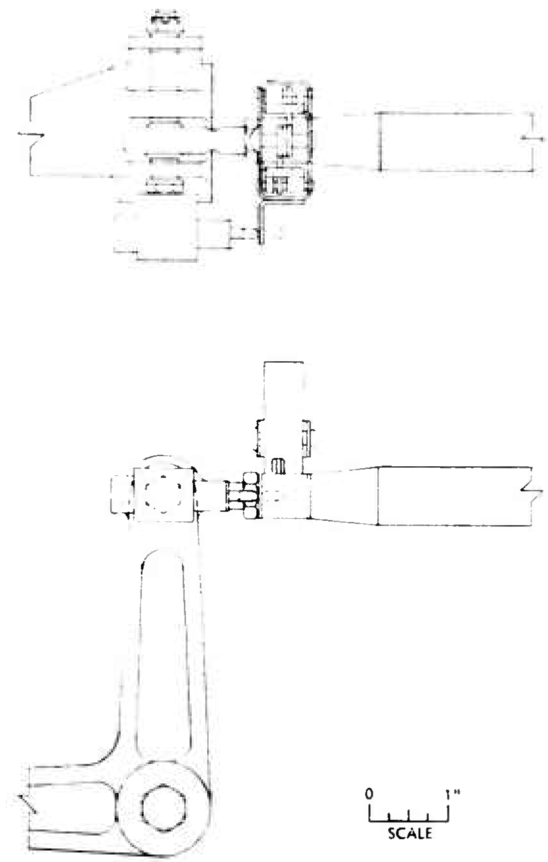


Figure 28. Rod End Bearing Play Sensor (Sheet 5 of 5).

Tail Rotor Control Chain

Tail rotor control chains are difficult to check for stretch and are usually removed for measurement.

Problem Description

During periodic inspection, tail rotor control chains are checked for wear by removal and measurement. Figure 29, extracted from TM55-1520-210-34P, illustrates a typical installation. The chain involved is the one which engages a sprocket on the tail rotor pitch change mechanism. The measurement of stretch on this chain is important but time consuming. Maintenance history records indicate that failure and replacement are due to the worn condition 68 percent of the time.

Recommendation

Do not remove the chain for measurement. Check only the 6-inch portion which normally engages the sprocket, which is the segment in which the greatest amount of wear occurs. This measurement should be made when the chain is tangential to the sprocket, as occurs when full left or right rudder inputs are made and held. Access to the installed chain is adequate for this check.

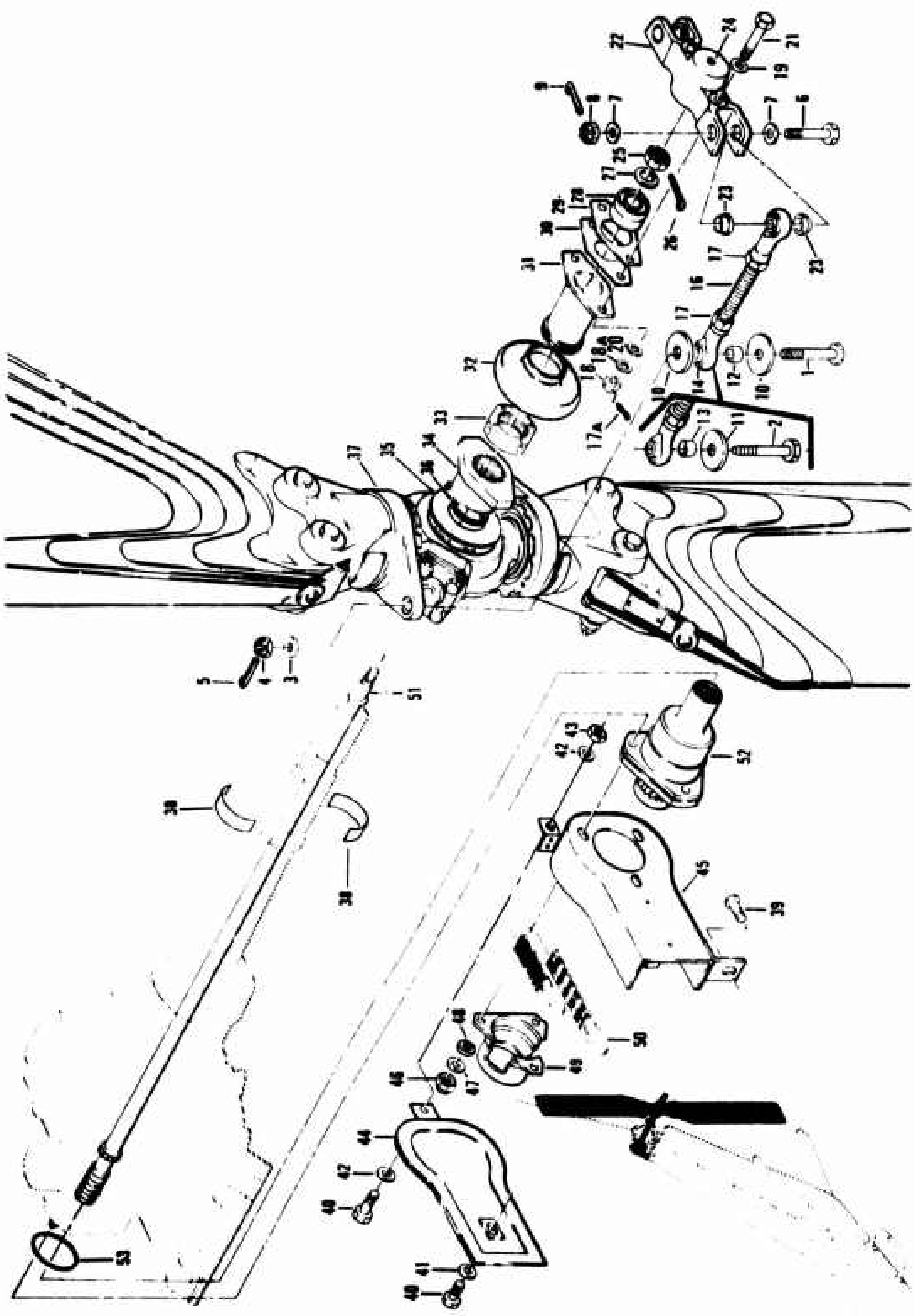


Figure 29. Tail Rotor Installation.

Eddy Current Inspection

Cracks in welds and areas of high stress in many cases are detected by dye penetrant inspection, which is a lengthy process.

Problem Description

Some aircraft components require lengthy dye penetrant inspections during the periodic interval check process. This procedure is used primarily in areas of high stress where metal fatigue can be critical.

Recommendation

Eddy current inspection should be investigated as a possible alternative to dye penetrant inspection in certain applications. Eddy current testing has been used for years successfully by the airlines in many applications. Today, these instruments are becoming very portable and are suitable for field use.

Battery

Battery periodic inspection involves removal from the aircraft to a shop for a capacity check, which is a time-consuming process.

Problem Description

Every 100 hours, the battery is removed and sent to the shop for a capacity check. The battery removal process is time consuming and induces failures (battery is dropped, fluid is spilled, etc.). Figure 30. extracted from TM55-1520-221-35P, illustrates battery installation. Field personnel claim that they rarely find anything wrong with the battery via the shop check. The two major causes for battery failure or rejection listed in maintenance history records are incorrect voltage (48 percent) and internal failure (17 percent).

Recommendation

Rely upon on-aircraft test of battery condition rather than capacity checks.

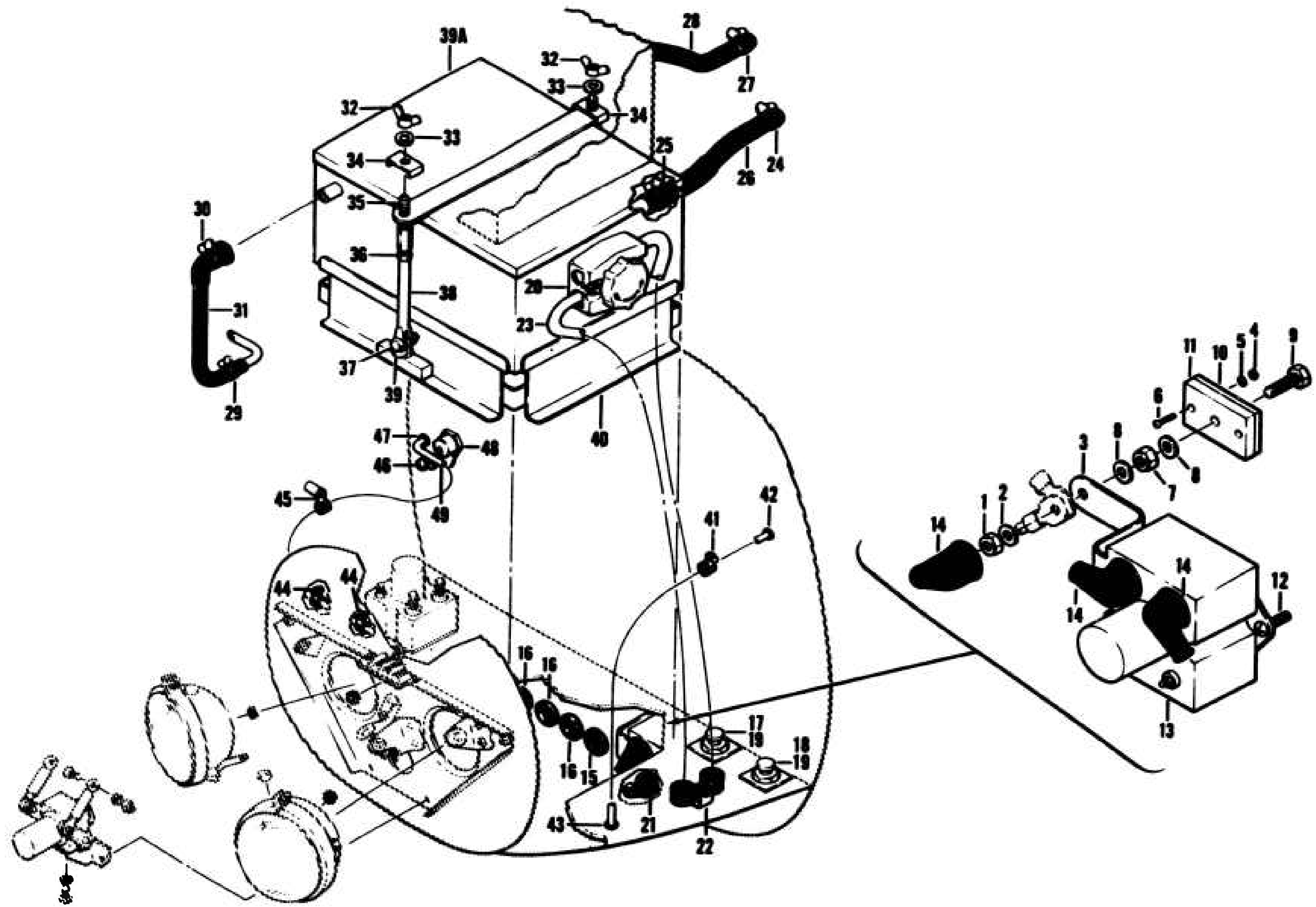


Figure 30 . Electrical Installation, Nose Compartment.

Landing Gear Cross Tubes and Dampers

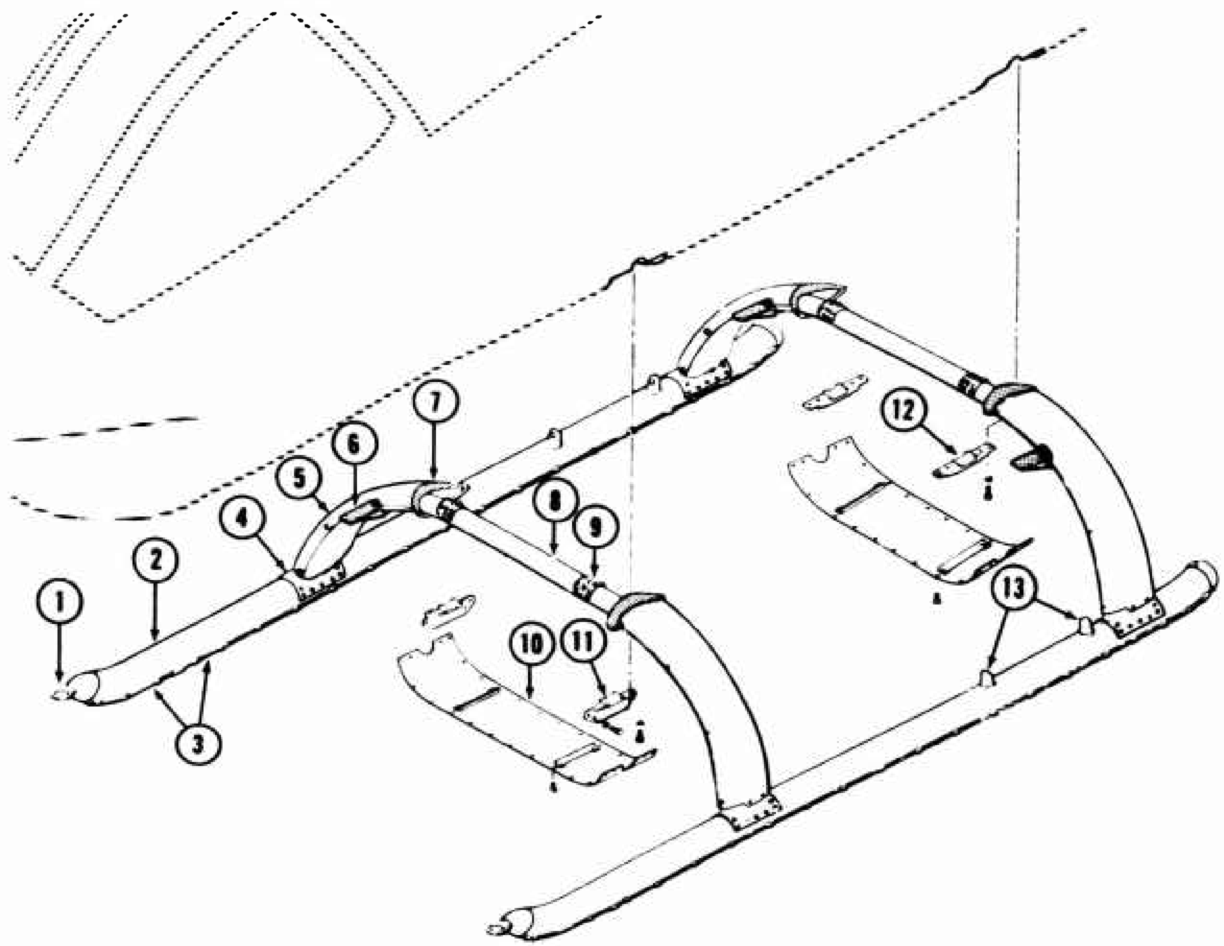
Landing gear inspections are difficult to accomplish and are therefore time consuming.

Problem Description

Inspection of skid-type landing gear calls for a periodic check for cross-tube spreading. This involves jacking and leveling the aircraft and using a plumb-bob procedure to measure cross-tube spread. The jacking and leveling operation makes this inspection check very time consuming. Figure 31 is an extract from TM55-1520-221-20 illustrating the typical landing gear configuration.

Recommendation

Provide dimensions for acceptable cross-tube spread with the aircraft on the ground. Conduct the more exacting inspection with the aircraft jacked only when the on-ground check indicates an unsatisfactory condition. Measure landing gear cross tube spread and diagonals with the aircraft on a flat, level surface. There is no need to jack the aircraft and employ plumb-bob leveling. Where dampers are involved, mark them with wear marks (by design or during assembly) on the damper body to indicate when the maximum tolerated extension or compression is exceeded. Visual inspection will be needed to detect loss of fluid or exterior damage.



1. Tow Ring
2. Skid Tube
3. Skid Shoes
4. Saddle
5. Fairing
6. Step
7. Seal
8. Cross Tube
9. Retainer
10. Cover
11. Support
12. Support
13. Eyebolts

Figure 31. Alighting Gear.

Tail Rotor Balancing

Scheduled tail rotor balancing is time consuming and of questionable value.

Problem Description

Current policy calls for removing and balancing the tail rotor at the periodic inspection interval. Field personnel have been unanimous in rejecting the value of this practice. Both blades tend to erode uniformly and remain in balance. When an imbalance condition does occur, moreover, an increase in high-frequency vibration is usually detected by the pilot and reported.

Recommendation

Eliminate the requirement to remove and balance tail rotors.

Pitch Varying Housing Assembly

Excessive wear in main rotor pitch housing striker plates is difficult to measure.

Problem Description

Periodic inspection for one aircraft type requires check of the main rotor pitch housing droop stop striker plates for looseness and excessive wear (Brinelling over .030 inch). It is difficult to accurately measure the depth of the depression with a dial indicator.

Recommendation

Substitute measurement of the width and length of the depression for the depth measurement. Correlation between the depth and area of the depression should make this a viable alternate inspection technique.

COMPONENT ACCESS

Access to various helicopter components and systems was one of the larger complaints received from inspectors and mechanics at the bases visited. Most of these problems are not amenable to simple solutions. They are, for the most part, inherently characteristic of the helicopter and the need to accommodate many components in a limited amount of space. However, since these complaints were so prevalent, the ones relating to design approaches are briefly discussed here as reference material for component and installation designers.

Internal Structural Corrosion

When corrosion occurs in some of the internal structural areas of the aircraft, particularly at points where skin contacts stringers, it is often very difficult or impossible to see. Most technical inspectors interviewed suggested that more access panels be added in such areas or that provisions be made for borescope inspection.

Flight Control Linkages

Control tubes, cranks, cables, etc., are often located under floor panels or in compartments or tunnels where access is poor. In some cases, segments of the system cannot be seen at all because a frame or bulkhead interferes. Most technicians interviewed suggested that greater attention be given to the overall accessibility of flight control systems in future designs.

Oil and Hydraulic Plumbing

The routing and installation of aircraft plumbing was a recurring complaint. Tubes and hoses are often crossed and routed in such a manner that certain fittings, valves, etc., are not visible for inspection. The problem is particularly acute when troubleshooting fluid leaks. Many inspectors thought that plumbing installations could be improved in future aircraft.

Critical Mounts and Fittings

Access to engine and gearbox mounts and major structural fittings is often restricted. Since these components are extremely critical to flight safety, a very thorough inspection is usually required. Poor access makes such inspections difficult and time consuming. A frequent complaint was that insufficient consideration had been given to the inspection task in the design of certain installations.

BUILT-IN MAINTENANCE/INSPECTION AIDS

Several practical built-in maintenance and/or inspection aids are mentioned here as candidates for retrofit to older helicopters and for consideration in design of new models. These aids are of the variety which gives a physical notification that something has occurred which could have a harmful effect on the future operational capability of that aircraft. After such occurrences, special inspections and repair actions, as required, should be invoked before further flights. Referred to are the common conditions of overtemperature, overspeed, hard landing, etc. Built-in equipment such as mentioned below exists for the most part but some conceptual design may also be required.

Overtemperature Indication

A mechanical latching,electrically actuated indicator can be used to indicate the fact that an overtemperature condition has occurred for a harmful period of time. The timing circuitry required is a part of this built-in latching mechanism. This indicator should be located in plain view for pilots, crew chiefs, mechanics and inspectors. An interlock on this indication should be used so it can not be reset until the proper maintenance is performed.

Overspeed Indication

This indicator is similar in construction to the overtemperature one. A mechanical latching, electrically actuated indicator is used to indicate that a harmful overspeed condition has occurred. The timing circuitry required would be a part of the latching indicator mechanism. The indicator should be located on a panel easily observed by pilots,

crew chiefs, mechanics and inspectors. Again, an interlock is required on the reset mechanism.

Hard Landing Indication

A simple accelerometer-based latching indicator could be used to indicate that a hard landing has occurred. This indicator either would have to assume that the aircraft was loaded to the maximum or would have to take into account variable load factors. It, too, should be located in plain view and not be resettable from the cockpit.

Metal Contamination Indication

A sophisticated version of the chip detectors now used in the engine and gearboxes is suggested for future aircraft. This could be a mechanical latching device of the pop-up or color-turning variety. This indicator would be valuable in conditions where rapid deterioration (and rapid metal contamination) is occurring.

Hydraulic System Contamination Indication

For those aircraft which rely on a hydraulic flight control system, fluid contamination is a problem. Envisioned is a filter, particle size, and quantity measuring device which will set an indicator when the allowable level of contamination is reached.

Overtorque Indication

Overtorque-time recording devices can be used to establish finite life times above the endurance limits for transmissions and drive shafts. Simple measuring circuitry is available which allows reliable records of the overtorque time to be accumulated. This in turn can be fed to a mechanical latching indicator which will notify maintenance personnel that the transmission and/or drive shaft should be removed for overhaul or replacement.

EFFECT OF RECOMMENDATIONS

An analysis was performed to assess quantitatively the improvements in inspection frequency and time that can be realized through the adoption of the recommendations contained in the previous section. This analysis was conducted using the MAVIS (Model for Analysis of Vehicle Inspection Systems) analytical computer model developed under the initial inspection requirements study contract (DAAJ02-71-C-0047). A brief description of the MAVIS model is contained in Appendix II.

Modeling Results

The modeling results presented are the result of comparisons made between a MAVIS run using previous study data and a run with input data changes made as a result of hypothetical implementation of the design approach and inspection technique recommendations. The reference data used is the same used in the final runs made during the previous study, while the new data is the result of analysis performed during this study. Summary results discussed utilize the UH-1 component configuration. This provides a clear picture of the improvements available using the most populous aircraft type for illustration. The summary results for the UH-1 show improvement in all the major parameters printed by the MAVIS scheme summary matrix. This includes maintenance and inspection man-hours, mission reliability, unscheduled Mean Time Between Maintenance actions (MTBM), availability, and scheduled and unscheduled time the aircraft is Not Operationally Ready for Maintenance (NORM). Figure 32 illustrates the magnitude of these inspection improvements in percent of the old value. The availability and reliability bars are shaded to indicate that what is shown is the improvement in unavailability and unreliability. In other words, the improvement is in the reduction of downtime and mission aborts, respectively.

Figure 33 explains the improvement or savings in maintenance man-hours by breaking down this category into its four constituents. This includes flight readiness inspection, scheduled inspection, preventive repair and unscheduled maintenance.

The shaded areas indicate the amount that the man-hours are reduced. The figure shows only the contributions to the man-hour totals due to the components for which data changes were made in the MAVIS model. The savings illustrated are 19 hours for flight-readiness inspection, 280 hours for scheduled

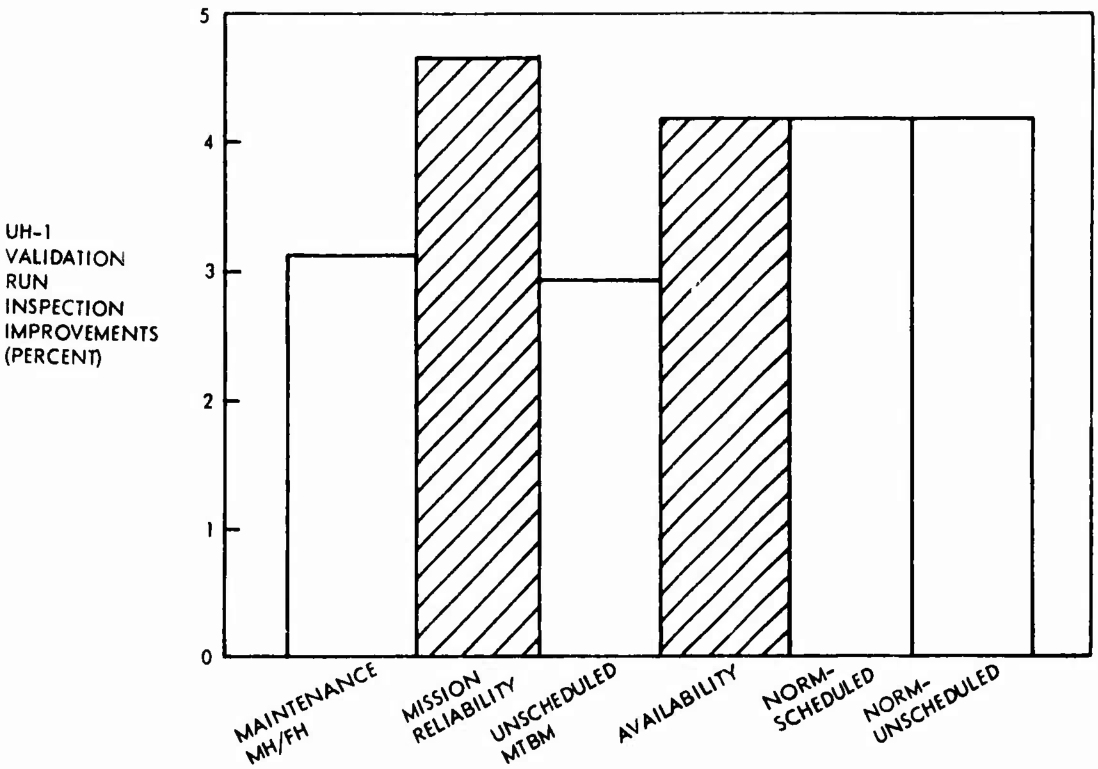


Figure 32. UH-1 Inspection Summary Comparison.

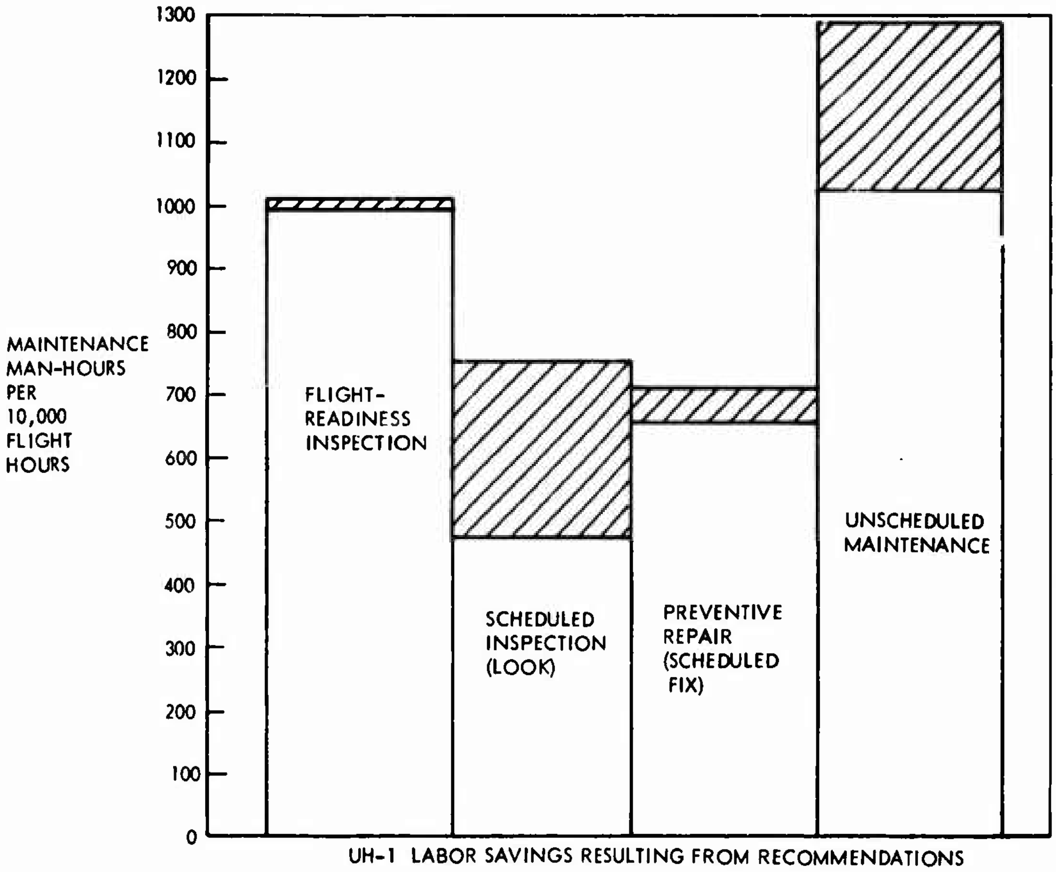


Figure 33. MAVIS Model Component Validation Results.

inspection, 58 hours for preventive repair, and 267 hours for unscheduled maintenance per 10,000 flight-hours.

Input Data Changes

The MAVIS model operates on a data base assembled from historical aircraft records. The master configuration file (Appendix III) is one of these records. It is essentially a master index of helicopter components grouped by major systems and subsystems. The types of components included in the file are those which have significance in terms of evaluating the impact of alternative inspection schemes on various helicopter subsystems. The master configuration file (MCF) was the record used to input the data changes to the MAVIS model. The changes in design approaches and inspection techniques suggested in the previous section affected six parameters in the MCF. These are deterioration start rate (per 100,000 flight-hours), T_{OS} hours, flight-readiness inspection time, scheduled inspection time, average elapsed repair time, and average repair man-hours. Changes to these parameters were based on component analysis as influenced by the recommendations in the previous section. Appendix IV lists the MAVIS model data changes for the 61 affected components. Input data changes to the MCF were made to only those items directly affected by a new design approach, inspection technique or inspection aid. Where a parameter change was not obvious, the entry in Appendix IV was left blank and the previous study data was used. Brief reasons for the component input data changes are listed in the right-hand column of the same appendix. Eight of the components listed do not affect the UH-1 helicopter, as they are unique to the CH-47 and/or CH-54 aircraft. These components are the shimmy damper assembly, wheel and tire assembly, SAS control actuator, cooler blower, boost pressure indicator, utility pressure indicator, EGT indicator, and oil pressure indicator.

Inspection Interval Analysis

Modeling capability was also used to determine if the inspection intervals should be lengthened for those components affected by the inspection design approach and technique recommendations. The MAVIS model provides printed results of variation in inspection interval which allows the maintenance engineer or analyst to select the best inspection interval. This feature is available on the inspection scheme component summary sometimes referred to as the "A" option output. Figure 34 is a sample page from the inspection scheme component summary. Note that each component is identified by its work unit code (WUC) and nomenclature followed by three lines of printing. Each line gives the various repair, flight-readiness, and inspection man-hours and times resulting from a given inspection interval. The right-hand column identifies the inspection interval. The top value of each group of three is the inputted value, while the others are one-half and twice this value. In this case, the inputted inspection interval value is the same as the result found in the previous study.

The inspection interval selection process was based on a comparison of the previous study result with the "A" option inspection interval variation using the data changes discussed in the previous subsection. Appendix V is an excerpt from the inspection scheme component summary from the previous study for all the changed UH-1 components. Appendix VI is an excerpt from the validation or new MAVIS run for the same components.

The interval selection process used four basic criteria:

1. No increase in flight aborts
2. No increase in mission aborts
3. Decrease in unscheduled repair elapsed maintenance time
4. Little or no increase in total man-hours

The blocked-in portion of Figure 34 illustrates how this inspection process was applied to the shaft coupling - Zurn type. Both the mission abort and in-flight abort quantity remained the same (zero) for all three inspection intervals. However, only twice the inputted interval value had a decrease in total man-hours and unscheduled elapsed maintenance time. This value for the inspection interval (200.0) was selected by the analyst and is denoted by the oval surrounding mark. Other recommended inspection interval changes are denoted in Appendix VI in the same manner. A total of thirty-two interval changes were recommended for the

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	QPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABORT	IN-FLT ABCRT	INTVL BETW INSP
2602030	SHAFT COUPLING - ZURN TYPE	12	47	*	181	60	94	*	336	85	0	0	0	100.0
			48	*	175	120	95	*	391	86	0	0	0	50.0
			46	*	184	30	92	*	307	83	0	0	0	200.0
2608010	PYLON MOUNT ASSEMBLY	1	13	10	15	25	31	27	98	21	19	0	0	100.0
			24	*	15	50	55	*	120	38	0	0	0	50.0
			7	16	15	13	15	44	87	11	31	0	0	200.0
2901010	ENGINE MOUNT	3	11	8	16	14	26	21	77	17	14	1	0	100.0
			19	*	15	28	44	*	88	29	0	0	0	50.0
			6	13	16	7	13	37	73	8	24	1	0	200.0
2902010	PARTICLE SEPARATOR ASSY	1	2	1	23	20	4	2	49	3	2	0	0	100.0
			3	*	22	40	5	*	67	5	0	0	0	50.0
			1	2	23	10	2	4	39	2	4	0	0	200.0
2907040	STARTER GENERATOR	1	1	10	0	1	5	39	45	3	27	2	0	400.0
			3	9	0	2	9	34	45	6	23	2	0	200.0
			1	11	0	1	2	42	45	2	29	2	0	800.0
4202010	GENERATOR	1	7	7	0	20	24	30	75	13	16	2	0	100.0
			14	*	0	40	50	*	90	26	0	0	0	50.0
			3	10	0	10	12	44	67	6	23	3	0	200.0
4202060	BATTERY	1	30	82	8	13	24	79	123	21	69	3	0	100.0
			59	58	7	25	48	56	135	42	49	2	0	50.0
			15	95	8	6	12	92	118	11	80	3	0	200.0
4909020	CHIP DETECTCR	4	0	5	0	1	0	3	3	0	2	1	0	800.0
			0	5	0	1	0	3	4	0	2	1	0	400.0
			0	5	0	0	0	3	3	0	2	1	0	1600.0

Figure 34. Sample MAVIS Model "A" Option Printout - Interval Analysis.

applicable UH-1 components. On the inspection scheme component summary, the abbreviation QPA stands for quantity per aircraft and an asterisk indicates a quantity less than 0.5.

Modeling Detailed Results

The detailed component modeling results are given in Appendix VI as explained above. It is interesting to note that the changed UH-1 components did result in fewer aborts. Figure 35 is an extract of Appendix VI, which lists those components which had an effect on mission abort and/or in-flight aborts. The net effect on mission aborts is a reduction of five and on in-flight aborts a reduction of one. However, these numbers are small when compared with the total number of aborts for the entire UH-1 aircraft: 147 for mission aborts and 35 for in-flight aborts per 10,000 flight hours.

		Mission Aborts		In-Flight Aborts	
Work Unit Code	Nomenclature	Old	New	Old	New
1103040	Removable Fairing/Cowling	2	1	0	0
1401050	Crank/Lever/Arm	1	1	0	0
1402060	Crank/Lever/Arm	1	1	0	0
1405100	Cable Assembly/Turnbuckle	1	0	0	0
2201010	Engine Assembly	4	4	1	1
2601010	Engine Drive Shaft	1	0	0	0
2901010	Engine Mount	1	1	0	0
2907040	Starter Generator	3	2	1	0
4202010	Generator	3	2	0	0
4202060	Battery	3	3	0	0
4909020	Chip Detector	1	1	0	0
5101070	Attitude Indicator	1	1	1	1
5102060	Master Caution Light	1	1	0	0
5102080	Caution Light	1	1	0	0
5107040	Tach Indicator	1	1	0	0
	Total	25	20	3	2

Figure 35. Mission and In-Flight Abort Reductions.

The UH-1 summary inspection scheme data can be compared in Figure 36. Listed are the previous study summary data alongside the validation run results. An improvement in all parameters occurs, as was shown by the chart of Figure 32.

UH-1 Aircraft Data

	Previous Study	With Changes
Flight Reliability	0.990	0.990
Mission Reliability	0.957	0.959
Availability	0.928	0.931
NORM - Scheduled	0.024	0.023
NORM - Unscheduled	0.048	0.046
Flight Readiness Inspection-MH/FH	0.451	0.449
Scheduled - Look - MH/FH	0.344	0.316
Scheduled - Fix - MH/FH	0.262	0.257
Unscheduled Maintenance - MH/FH	0.736	0.714
Total - MH/FH	1.793	1.737
Unscheduled MTBM	3.4	3.5

Figure 36. UH-1 Inspection Scheme Summary Matrix Comparison.

CONCLUSIONS AND RECOMMENDATIONS

The section of this report entitled "Recommended Design Approaches for Inspection" contains the specific recommendations developed in the study for improvement in the inspection function for Army aircraft. These recommendations are those considered worthy of implementation or as candidates for future conceptual design study.

Field surveys taken during the study indicate that more concentrated effort in adhering to established maintainability goals presents a major opportunity for improvement in the maintenance function. Better accessibility and simplicity in design are basic provisions which deserve higher priority in future designs.

It is also clear that, although at some future time highly sophisticated diagnostic systems may become a part of the aircraft configuration and support system, aircraft inspection, to be complete, will still require the participation of the trained mechanic. Many of the inspection requirements are simply of a nature that is better accomplished by a trained human. It is therefore also recommended that future study be devoted to development of simple inspection devices to improve inspection efficiency through a reduction in requirements for subjective judgment on the part of the inspector.

APPENDIX I

ORGANIZATION FOR INSPECTION AT UNITED AIR LINES

AIRCRAFT INSPECTION PROGRAM

United Air Lines' aircraft inspection program is conducted through two separate divisions: (1) the San Francisco Maintenance Base and (2) the Line Maintenance Department.

Responsibility for aircraft inspection at the San Francisco Base rests with the Director of Base Inspection. This responsibility is functionally carried out through inspections, checks, and tests performed by aircraft inspectors, shop inspectors, lead mechanics and mechanics in the various shop administrations.

Inspection Authority and Responsibility

Inspection authority at the San Francisco Base is classified as "Direct", "Delegated" or "Service Inspection" authority. Direct inspection authority is delegated within the Inspection Division only. The Inspection Division retains the responsibility to call out and assure accomplishment of all necessary inspections for the following areas/items:

1. Airplane Overhaul

    a. Plane Overhaul Docks - All inspection functions are accomplished by aircraft inspectors. The ratio of inspectors to mechanics is 1:13.

    b. Plane Overhaul Ramp - All "Critical Item" inspections are accomplished by aircraft inspectors. Inspectors are assigned from the docks when needed.

2. Power Plant Overhaul

    Final Engine Buildup - Final inspection of completed engine assemblies is accomplished by aircraft inspectors. Six aircraft inspectors, two per shift, are assigned to the engine shop.

3. Overhaul/Repair of primary structural components and mechanical flight control mechanisms

a. Sheet Metal Shop - Preinspection and final inspection of flight control surfaces, reversers and primary sheet metal structures are accomplished by aircraft inspectors. The ratio of aircraft inspectors to mechanics is 1:20.

b. Landing Gear and Component Shop - Final inspection of all landing gear assemblies and mechanical flight control mechanisms is accomplished by aircraft inspectors.

Delegated inspection authority is given to various shops. This authority gives the particular shops the right to plan and carry out their inspections through shop inspectors, lead mechanics and various mechanics, subject to audit by Quality Assurance sampling inspections.

1. Airplane Component Overhaul Division

   a. Instrument Shop - Mechanics test and inspect parts and assemblies to the extent necessary to accomplish their work. Final inspection is accomplished by shop inspectors. The ratio of shop inspectors to mechanics is 1:58.

   b. Radio Shop - Mechanics test and inspect parts and assemblies to the extent necessary to accomplish their work. Final inspection is accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10.

   c. Recording Shop - Mechanics test and inspect parts and assemblies to the extent necessary to accomplish their work. Final inspection is accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10.

   d. Accessory Shop - Mechanics test and inspect parts and assemblies to the extent necessary to accomplish their work. Final inspection is accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10.

e. Electric Shop - Mechanics test and inspect parts and assemblies to the extent necessary to accomplish their work. Final inspection is accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10. One shop inspector is assigned to the shop and is responsible for the inspection of all shop-manufactured items and assemblies.

f. Landing Gear and Component Shop - Landing gear parts are preinspected by shop inspectors. Final inspection of landing gear assemblies is accomplished by aircraft inspectors. Component shop parts are inspected and tested by the mechanic to the extent necessary to accomplish his work. With the exception of mechanical flight control mechanisms, which are inspected by aircraft inspectors, final inspection of component shop parts is accomplished by the lead mechanics. Two aircraft inspectors, 6 parts inspectors, 11 lead mechanics, and 94 mechanics are assigned to the Landing Gear and Component Shop.

g. Cabin Equipment Shop - Preinspection and final inspection of cabin chairs are accomplished by shop inspectors. The ratio of shop inspectors to mechanics in the Chair Group is 1:30. Preinspection and final inspection of emergency and survival equipment are accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10. Final inspection of plastic shop items is accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10. Selected units such as radioactive placards, webbing, seat belts, etc., are preinspected by a shop inspector. Except for those areas mentioned above, mechanics in the Cabin Equipment Shop approve their own work.

2. Power Plant Overhaul Division

   a. Welding Shop - Final inspection is accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10.

b. Plating Shop - Final inspection is accomplished by shop inspectors. The ratio of shop inspectors to mechanics is 1:11.

c. Machine Shop - Final inspection is accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10. Eleven shop inspectors are assigned to the shop, but their function is that of planning the work.

d. Turbine Engine Inspection & Test - Parts inspectors preinspect engines during disassembly to determine how much work will be required to make the engine serviceable. They also inspect individual engine parts and approve any required rework to these parts. The ratio of parts inspectors to mechanics in the Power Plant Division is 1:6. Mechanics are responsible for engine test cell runs.

e. Turbine Engine Overhaul - Any required inspection in this area is accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10.

f. Turbine Engine Repair - Any required inspections in this area are accomplished by lead mechanics. The ratio of lead mechanics to mechanics is 1:10.

Service inspection is provided upon specific request from the organization which has overall responsibility for quality of the item involved.

1. Inspection Division

a. Nondestructive Testing - Aircraft inspectors provide the following inspections:

- X-ray
- Isotope
- Magnetic particle
- Fluorescent penetrant
- Ultrasonic
- Eddy current

b. Receiving Inspection - Aircraft inspectors inspect all UAL-designed parts, whether manufactured by UAL or outside vendors. Vendor-designed parts are inspected upon request by Engineering, Purchasing, shops, etc. Aircraft inspectors are continually inspecting items received in stock.

c. Metrology Laboratory - Inspection maintenance technicians provide periodic inspection of tooling used for alignment, assembly and inspection of work.

2. Turbine Engine Inspection and Test

a. Nondestructive testing - Shop inspectors provide the following inspections:

- Magnetic particle
- Fluorescent Penetrant
- Ultrasonic
- Eddy current

3. General

a. Receiving Inspection - Many shops do their own receiving inspection because they are better equipped to do this work.

b. Standards Laboratory - The Instrument Shop maintains a Standards Laboratory for electrical and pressure measurements.

Quality Assurance inspection specialists and technicians, under the direction of the Quality Assurance Manager, are assigned to monitor and audit the Base Maintenance program of surveillance and sampling inspection to assure product conformity in all areas in which the inspection function is delegated.

An Inspection Division Technical Services Group (1) works with aircraft overhaul maintenance specialists, planners, and engineering in developing job cards and procedures, (2) approves all plane overhaul/inspection job cards and procedures, and (3) reviews job cards after each overhaul and coordinates changes in job card procedures when deemed necessary.

UAL's inspection and production functions are completely separated only below that level which UAL feels can reasonably be held responsible and accountable for both.

APPENDIX II

MAVIS - MODEL FOR ANALYSIS OF VEHICLE INSPECTION SYSTEMS

MAVIS is a computer model which analyzes the effectiveness of scheduled inspection schemes. It was developed for the U. S. Army Air Mobility Research and Development Laboratory during a previous study entitled "Analysis of Army Helicopter Inspection Requirements". The final report of that study (USAAMRDL Technical Report 72-35) contains a detailed description of the MAVIS model. MAVIS operates on a data base assembled from historical aircraft records to optimize an inspection system in terms of cost and effectiveness parameters. It can be used to evaluate inspection schemes and inspection checklists. The following is a brief description of the MAVIS model extracted from the previous study report.

INSPECTION MODEL DESCRIPTION

The computerized mathematical model developed in the study is structured to provide a systematic method for evaluating the effectiveness of alternate inspection concepts. The magnitude of the aircraft inspection process in terms of the number of components involved places practical constraints on the analytical processes which could be applied in the model. Essentially, the analysis must be sufficiently general to permit its application to all the components encompassed by the inspection procedure. The parameters required to perform the calculations must also be readily extractable from existing inspection data.

The complete model uses the facility of the digital computer to sequentially apply the basic analytical concept to the total spectrum of components. The results of all these analyses are then combined to provide a profile of the characteristics of the inspection scheme. The profile can be presented in a variety of ways to emphasize such key factors as maintenance man-hours per flight-hour, aircraft availability, etc.

In the study a simple analytical method was developed which enables the number of good, failing, and failed components in a population to be computed as a function of the inspection interval expressed in flight-hours. The computation uses component parameters which can be extracted in a straightforward manner from the available inspection data.

The model produces the profile of the characteristics of the inspection concept on the basis of a data input which supplies the component parameters, the component mix in the aircraft, and a formal description of the inspection concept which quantitatively defines inspection intervals. Mission profile information contained within the model data bank provides the capability of converting calendar time to flight hours when a calendar inspection concept is to be evaluated.

Model Structure

The inspection analysis model, shown schematically in Figure 37, is designed to perform several basic functions. It will define each of the specified helicopter configurations in terms of the types and quantities of components comprising its various subsystems. This is accomplished by means of the aircraft configuration files, which store all of the necessary component background data required for the analysis. Other inputs to the model include the data defining the inspection scheme, the aircraft types, and inspection crew sizes to be evaluated.

The computer program combines the input parameters with the component characteristics and performs a series of calculations which yield expected values for preventive repairs, failures, and maintenance man-hours for inspection and repair under the inspection scheme. This process is continued until all components comprising one helicopter configuration have been evaluated. Next the expected values are processed to provide a summary of selected indicators for the helicopter type under the inspection scheme. Cycling through the model continues until all of the helicopter configurations have been evaluated. At the conclusion of the computer run, a matrix is generated which displays the summary of expected value outputs shown in Figure 38. The figure shows the data matrix printed out as the summary of results for each computer run.

Comparison of results from different computer runs led to model iterations with input parameters modified to investigate the impact of variations in significant areas. This iterative process was followed until sufficient information was available to allow selection of the optimum inspection concept.

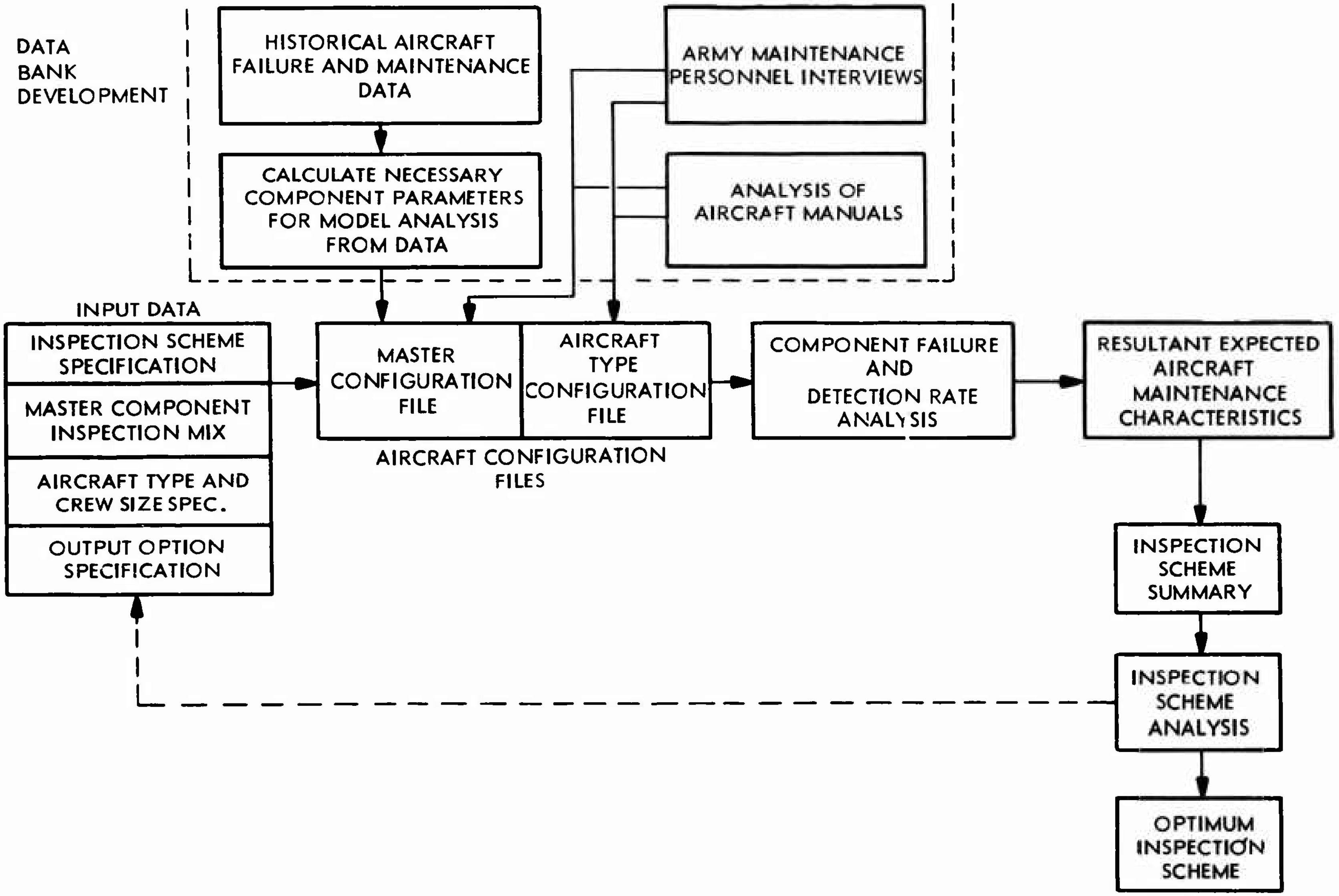


Figure 37. Inspection Analysis Model Schematic.

BASIC OUTPUT CALCULATIONS	LOH	AH	UH	CH-MEDIUM	CH-HEAVY
FLIGHT RELIABILITY					
MISSION RELIABILITY					
AVAILABILITY					
NORM-SCHEDULED					
NORM-UNSCHEDULED					
MH/FH - FLT READINESS INSP					
MH/FH - SCHEDULED - LOOK					
MH/FH - SCHEDULED - FIX					
MH/FH - UNSCHEDULED MAINTENANCE					
MH/FH - TOTAL					
UNSCHEDULED MTBM					

(Column group heading: HELICOPTER TYPES)

Figure 38. Inspection Scheme Summary Matrix.

Aircraft Configuration Files

The model can process computer configurations for all of the basic types of helicopters and also is easily expandable to additional types if this should be desired in the future. This is accomplished by the data bank structure incorporated into the model. This consists of two types of aircraft configuration files: the master configuration file and the aircraft type configuration file.

The master configuration file contains a data record for each generic type of helicopter component which requires scheduled inspection based on the composite analysis of all five types of helicopters (LOH, UH, AH, CH-Medium, and CH-Heavy). In most cases, study input data indicated that all components of a certain type have similar basic failure behavior. Where there was a marked difference, multiple entries for those components were made in the file. Thus, failure data from all helicopter types has been used to generate the typical component failure data records for each generic type of component within the master configuration file.

The aircraft type configuration files consist of one file for each type of helicopter to be evaluated. Each file contains the helicopter type and a list of those components in the master configuration file which are included on that type of helicopter. To evaluate an inspection scheme for a certain type of aircraft, the model combines the corresponding inspection input data and master configuration file records with all components and quantities listed in the appropriate aircraft configuration file, performs the necessary calculations, and prints out the desired output data.

Program Input Data

The input data for the program consists of four groups, as shown in the schematic of Figure 37. The first two groups completely describe the inspection scheme being evaluated. The inspection scheme specification includes the identifying inspection scheme number, the flight-hour interval between scheduled inspections, the total flight-hours in an inspection cycle, and the types of flight-readiness and scheduled inspections to be applied. The term "flight readiness" refers to preflight, postflight, or daily inspection or combinations of these inspection types.

The master component inspection mix lists all components to be inspected and whether or not each component is to be inspected at preflight, postflight, or daily inspections. It also includes the number of the scheduled intervals at which the component is to be inspected. This sets the scheduling concept to be used for each component inspected within the inspection scheme. With this program structure, several different schemes or time intervals can be evaluated by changing only the inspection scheme specification input card.

The last two groups of input data include the aircraft type and crew size specifications and the output option specification. The first of these specifies the aircraft types to be evaluated by the model and the inspection crew sizes to be applied at each inspection within an inspection cycle. The inspection crew size includes only those maintenance personnel actually employed in inspecting the aircraft. The output option specification allows the user to specify the outputs of interest in the model run being made.

Model Calculations

Figure 39 shows the mathematical calculation flow contained within the model. Data transfers from aircraft data files and from inspection concept specification inputs are indicated. The terms λ, T_{OS}, and failure analysis model used in the figure are defined and discussed under the subheading which follows (Model Failure Theory). A complete description of the mathematical formulations utilized in the model is provided in Appendix I of USAAMRDL Technical Report 72-35.

Model calculation flow results in computation of four major outputs: availability, total maintenance man-hours per flight-hour, flight reliability, and mission reliability. These major parameters are calculated as follows:

Availability

Availability as used in this study has been calculated based on a desire for the aircraft to be available 24 hours/day and 7 days/week. There is one exception to this basic assumption. It is assumed that the flight-readiness inspections (preflight, postflight, or daily inspections) can be accomplished around the required operational use of the aircraft, and thus the elapsed time required for flight-readiness inspections has not been included in downtime and availability calculations within the model.

$$\text{Availability} = 1 - \frac{\text{Downtime Hr/1000 Flt-Hr}}{\text{Calendar Time Hr/1000 Flt-Hr}}$$

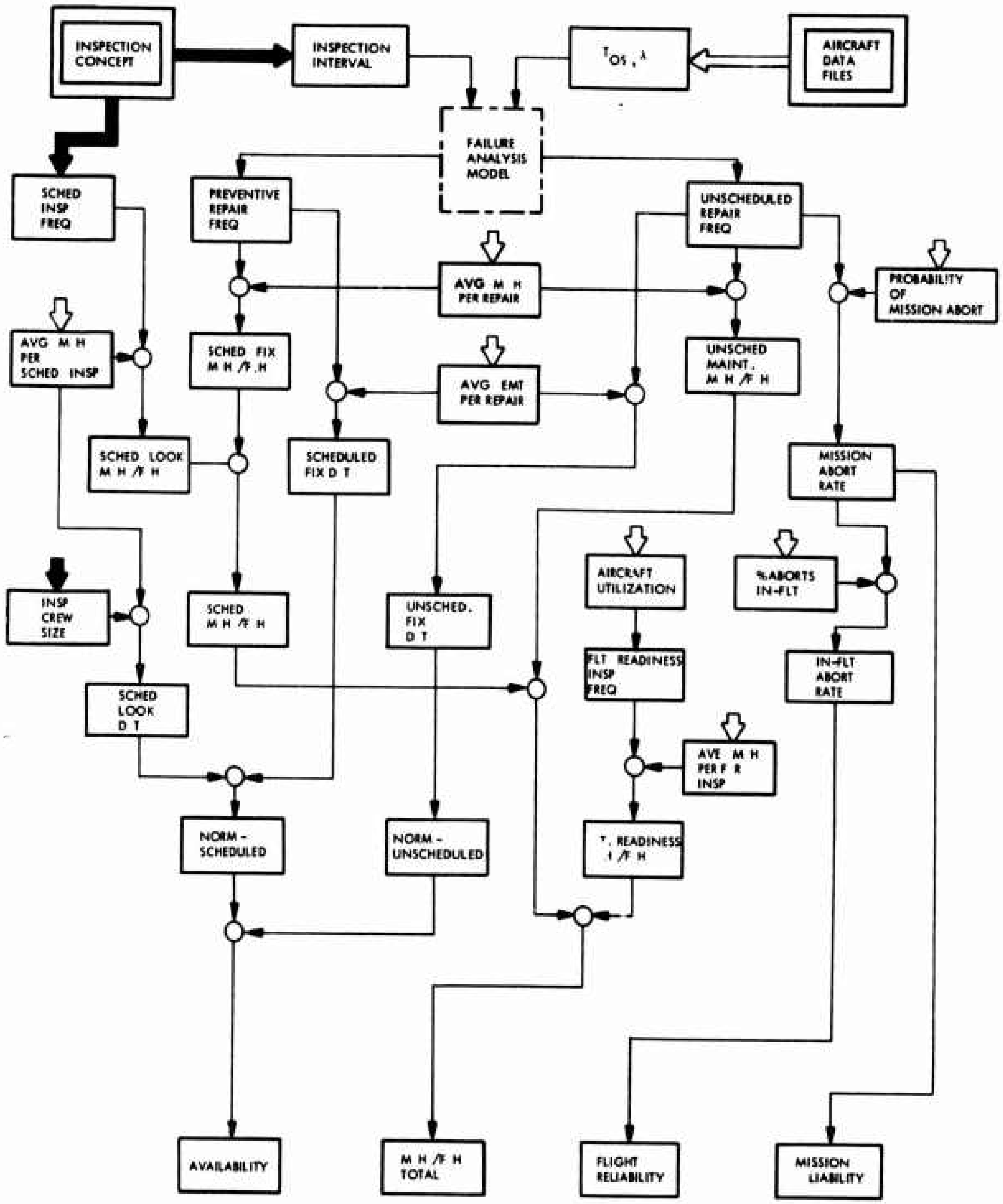
$$= 1 - \frac{\text{Downtime Hr}}{\text{Calendar Time Hr}}$$

where calendar time per 1000 hours is based on the average utilization of the appropriate aircraft type.

It should be noted that the availability calculated will be higher than that normally expected since no downtime due to awaiting maintenance or supply time is included. Only downtime due to inspection and repair actions is included in the calculation.

Total Man-Hours Per Flight-Hour

Total man-hours per flight-hour as calculated within the model is the summation of all maintenance man-hours required



= DATA TRANSFER FROM AIRCRAFT DATA FILES

= DATA TRANSFER FROM INSPECTION CONCEPT SPECIFICATION DATA

DT - DOWNTIME
EMT - ELAPSED MAINTENANCE TIME
FH - FLIGHT HOUR
FLT - FLIGHT
FR - FLIGHT - READINESS
FREQ - FREQUENCY
INSP - INSPECTION
MH - MAN - HOURS
SCHED - SCHEDULED

Figure 39. Model Calculation Flow.

for all inspections and for all scheduled and unscheduled repair (fix) actions.

Note that this man-hour calculation does not include time required for the day-to-day upkeep of the aircraft. Such items as man-hours required for washing, cleaning, mooring, ground handling, fueling, etc., are not included. "Total" man-hours calculated in the study then are lower than those that should be expected operationally. Study evaluation in this area is based upon comparative manpower required for inspection and repair between the various inspection concepts and not calculation of absolute cperational manpower requirements.

Flight and Mission Reliability

Flight and mission reliability calculations are based upon failure history data for the percentages of failures causing in-flight and mission aborts. Mission abort probability includes failure causing both preflight and in-flight aborts. Preflight aborts are defined as those aborts caused by discovery of the requirement for maintenance by the air crew before takeoff and after ground maintenance personnel have completed their inspection. Flight and mission reliability are calculated using the following formulas:

$$\text{Flt Reliability} = 1 - \frac{\text{Total In-Flt Aborts/10,000 Flt-Hr}}{\text{Total Number of Flts per 10,000 Flt-Hr}}$$

$$\text{Mission Reliability} = 1 - \frac{\text{Total Mission Aborts/10,000 Flt-Hr}}{\text{Total Number of Flts per 10,000 Flt-Hr}}$$

The total number of flights per 10,000 flight-hours is dependent upon the mission profile for each aircraft type.

Model Failure Theory

In order to realistically calculate the effects of variations in inspection interval on the operational parameters of an aircraft, it is necessary to model the relationship between component inspection interval and failure behavior. Two general failure categories exist. Either a component wears out, with the probability of failure increasing with increasing hours of operation, or random failures occur during the useful life of a component.

A single component can fit into both of these categories. Figure 40 shows a typical failure rate versus operating time curve for such a component.

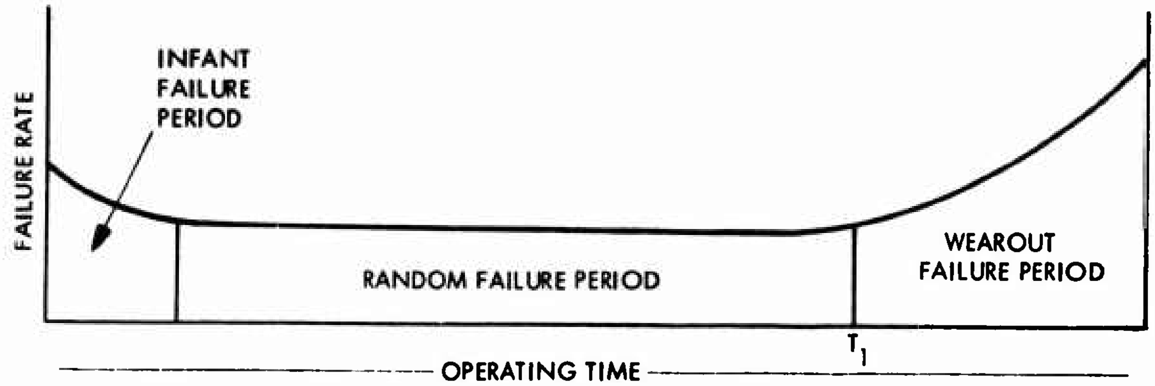


Figure 40. Failure Rate Versus Operating Time.

As operating time is increased, after an initial infant failure period, failures of the random type are to be expected. Then as the expected end of component life is approached, a component wearout failure period is entered. Shifting the time when inspection is scheduled, T_1, creates an expected component failure behavior characteristic fitting only one of the general failure categories mentioned. Thus this type of representation can then be used to fit a wide range of component failure behavior.

Using present inspection techniques, these component failures may occur without any detectable warning signs or progressively such that the onset of failure is detectable prior to its occurrence. Scheduled inspections should place major concern on components of this latter type since it is only these components whose failure behavior is affected by inspections.

Field data available for this study was sufficient to allow for the development of model and data bank considering both the random and wearout failure properties of components. Data necessary for analysis of the infant failure period was not available; therefore, no distinction between these and random failures was made. The model takes into account whether or not present inspection methods typically detect any impending component failures. The five basic assumptions used in the model are as follows:

1. Start of failure is random. All components are assumed to have a random rate of entering a detectably deteriorated state, λ.

2. Given that a component has entered the deteriorated state, there is an average time interval, T_{os}, between the time when the component is first detectably unacceptable and the time at which failure occurs (for sudden or undetectable failures, $T_{os} = 0$).

3. If a component is found in a detectably deteriorated state during a scheduled inspection (flight-readiness inspections not included), a preventive repair will be made at that time.

4. A component is assumed not to be deteriorated at the time of installa on.

5. If a component failure occurs between inspections, the component will be replaced at that time.

The key to understanding the failure behavior model is the T_{os} concept. T_{os} has been defined as the average time interval between the time when the component is first detectably unacceptable and the time at which failure occurs. Figure 41 illustrates the relationship of T_{os} to an average detectable failure characteristic for a sample component. Any single component of this type may suffer from either a more abrupt failure or a longer deterioration interval than is represented in this figure, meaning that for a given component there is actually a deterioration interval distribution around the average value of T_{os}. The model was developed for use in studying the general relationship of different inspection concepts to the operational parameters of all Army helicopter types. Results were derived through use of data for a listing of generic components present in many or all of the five typical helicopter types under evaluation. Generic component data used was, in most cases, a composite of historical data for the many types. In this situation, incorporating T_{os} distributions would have had little effect when comparing model outputs for the different candidate inspection schemes. Thus, the T_{os} average values used were considered sufficient for the required model calculations.

T_{os}, as used in this study, reflects the ability of present inspection techniques to detect failure onset since the data base

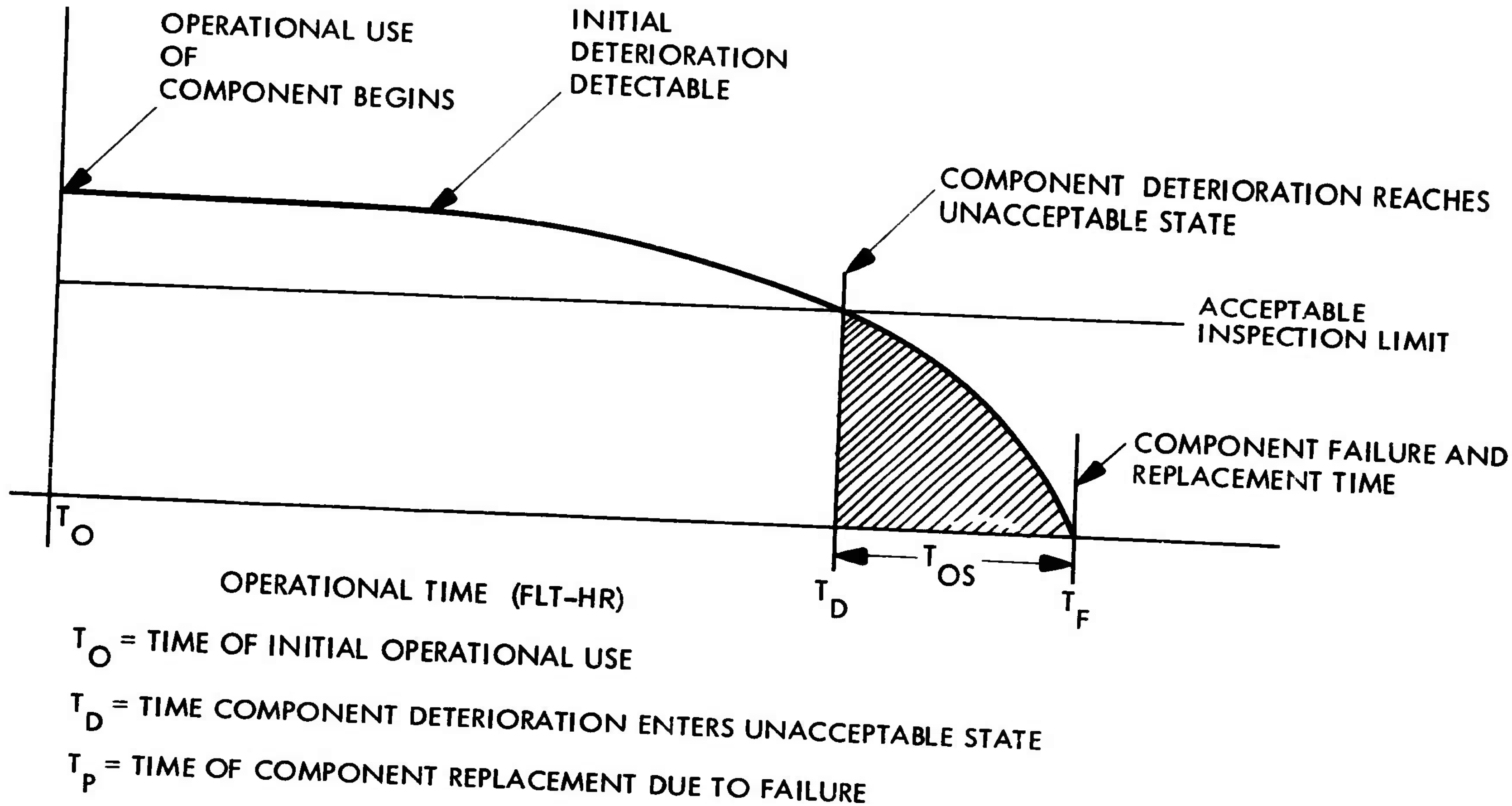


Figure 41. Component Deterioration and T_{os}.

from which it is derived is recent maintenance records. Calculation of T_{os} from data is dependent upon breaking the historical failures up into "when found" classifications. T_{os} for a component is directly related to the percentage of past failures found during scheduled inspections and the corresponding time interval between inspections. If present inspection techniques in general are unable to detect the deterioration of a component, the resultant impending failures found and replaced during scheduled inspections will be near zero, implying that $T_{os} = 0$. If, however, present inspection techniques have consistently found most impending failures during scheduled inspections, a longer T_{os} of the same order of magnitude as the time interval between inspections is implied. Thus, T_{os} reflects not only the deterioration characteristics of a component but also the effectiveness of present inspection techniques.

The effect of component replacements leads to a random failure distribution across time. The probability of a component's entering the detectably unacceptable state by a certain time can be calculated using the basic exponential equations associated with random failures modified to take into account the effects of replacement and T_{os}. If a component enters the detectably unacceptable state at a time less than its T_{os} before the next scheduled inspection, it will result in an impending failure being detected at that time. Thus, by calculating the probability of a component's entering the detectably unacceptable state within the time T_{os} before an inspection, the probability of an impending failure's being found during an inspection has been calculated. The same basic equations have been used to calculate the probability of a component failure occurring between inspections. Figure 42 illustrates the relationship of T_{os} to scheduled inspection intervals with three examples. The first example, Component X, has been characterized by a T_{os} much smaller than the scheduled inspection interval, which results in a small percentage of component replacements occurring at inspection intervals. The second example, Component Y, illustrates the opposite extreme for a T_{os} greater than the inspection interval, which results in most replacements occurring at scheduled inspection intervals. The third example, Component Z, indicates the result for an intermediate value of T_{os}. A detailed description of the mathematical modeling of component failure behavior and the calculation of the required model parameter is included in Appendix I of USAAMRDL Technical Report 72-35.

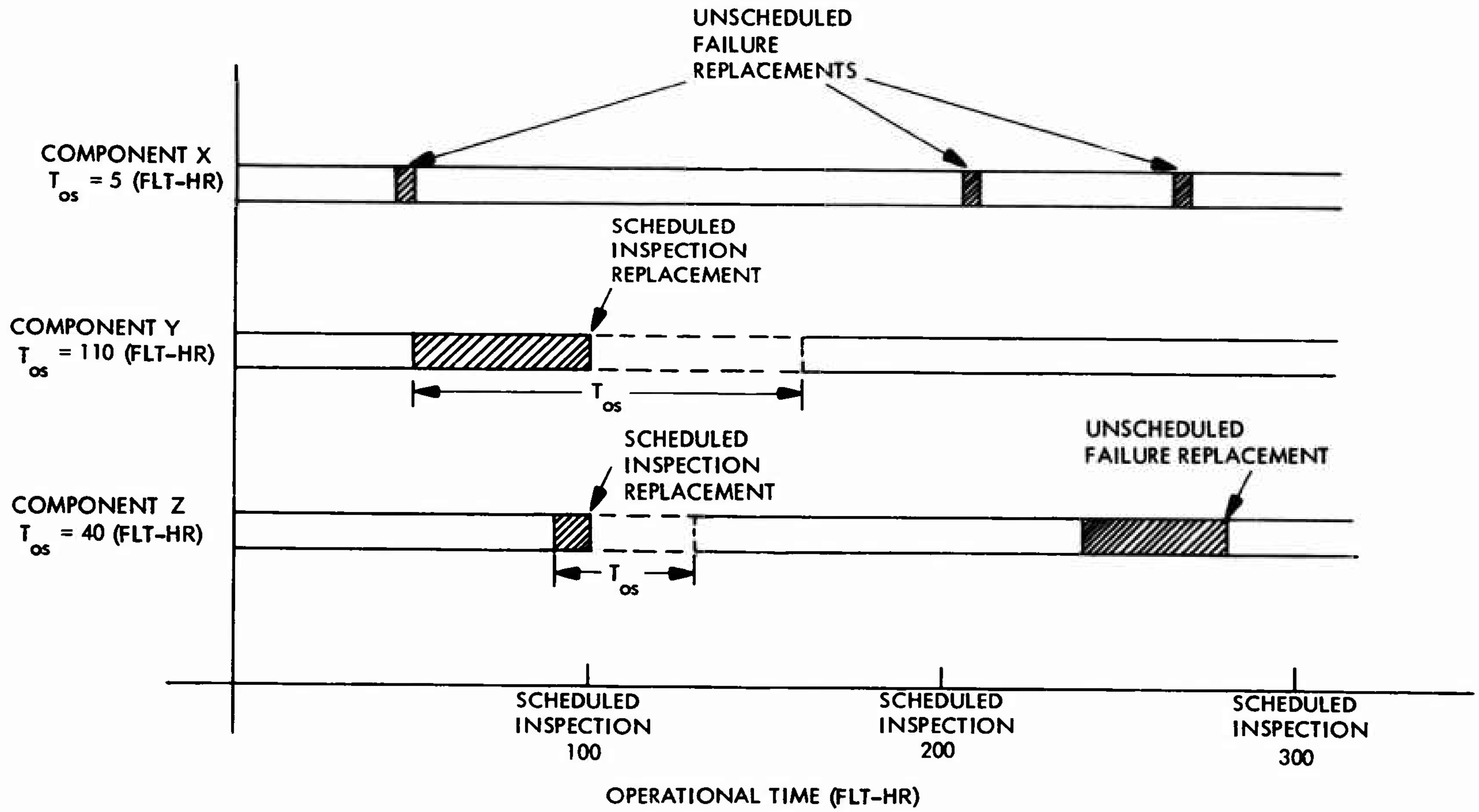


Figure 42. Variation in T_{os} Versus Inspection Interval.

APPENDIX III
MAVIS MASTER CONFIGURATION FILE

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

MUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TDS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
110000 AIRFRAME SYSTEM																					
110100 FUSELAGE SUBSYSTEM																					
110101 FRAME/STRINGER	67020	67M20	68G20	67	190 30		731 10		106 8		52	3.7	6.5	23.6	N		0.0	09		6.7	2.9 6.7
110102 SKIN	67020	67M20	68G20	685	730 30		105 13		190 11		29	5.5	13.0	20.1	Y	09	1.50	09		15.0	2.2 3.5
110103 WINDSHIELD	67020	67M20	67020	92	935 37		605 19		070 6		29	3.9	5.5	80.5	Y	09	0.10	09		0.5	3.4 5.8
110104 WINDOW	67020	67M20	67020	14	070 41		190 14		106 7		15	2.4	4.4	99.9	Y	09	0.10	09		0.5	1.4 2.1
110105 ESCAPE HATCH	67020	67M20	68G20	126	070 17		190 14		106 13		101	2.0	5.8	6.8	Y	09	0.10	08 09		1.0	1.9 2.5
110106 HATCH JETTISON MECHANISM	67020	67M20	67020	10	190 50		127 25		780 25		63	0.0	0.0	0.0	N		0.0	08 09		4.0	0.9 0.9
110107 CARGO RAMP	67020	67M20	68G20	410	540 17		780 14		190 13		76	0.7	1.0	99.9	Y	09	0.30	08 09		10.0	2.4 4.5
110108 HORIZONTAL STABILIZER SECTION	67020	67M20	68G20	133	020 33		127 14		780 14		62	2.2	5.1	0.0	Y	09 10	0.20	08 09	10 11	4.0	1.8 2.6
110109 STEP/HAND HOLD	67020	67M20	68G20	7	117 100		 0		 0		104	0.0	0.0	0.0	N		0.0	09		0.3	0.4 0.6
110110 ANTENNA/SUPPORT	67020	35K20	35K20	45	780 22		301 18		730 15		0	0.0	0.0	0.0	Y	09	0.05	09		0.5	0.9 1.8
110200 COCKPIT/CABIN DOOR SUBSYSTEM																					
110201 SLIDING CABIN DOOR	67020	67M20	68G20	470	127 25		730 13		135 9		24	0.4	0.6	99.9	Y	08 09	0.20	08 09	10	3.0	1.2 1.7
110202 HINGED CABIN DOOR	67020	67M20	68G20	275	070 19		190 16		020 9		37	1.2	1.8	0.0	Y	08 09	0.20	08 09		2.0	1.2 1.4
110203 DOOR STRUT SET	67020	67M20	67020	20	106 33		127 33		932 33		0	0.0	0.0	0.0	N		0.0	08 09		1.0	0.4 0.4
110204 DOOR LATCH MECHANISM	67020	67M20	67020	48	127 26		070 24		106 5		21	2.0	2.6	0.0	Y	08 10	0.10	08		0.5	1.3 1.7

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFIT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
110205 67020 67W20 67020	2	190						0	0.0	0.0	0.0	N		0.0	09		4.0	1.2
DOOR JETTISON MECHANISM		100		0		0									09			1.2
110300																		
ACCESS DOOR/COWL SUBSYSTEM																		
110301 67020 67W20 68G20	70	190		070		106		53	0.2	0.5	29.3	Y	09	0.10	08	26	1.5	1.2
HINGED ACCESS DOOR/COWLING		17		16		14									09			1.4
110302 67020 67W20 68G20	27	070		190		780		55	3.4	4.8	0.0	Y	09	0.10	08		2.0	1.7
HINGED WORK PLATFORM		28		23		9									09			2.0
110303 67020 67W20 67020	6	070		190		780		24	4.2	8.3	0.0	Y	09	0.05	08		0.5	1.0
DOOR/COWL/PLTFM LATCH MECHSM		62		11		7												1.1
110304 67020 67W20 68G20	558	190		106		070		72	2.6	6.1	16.9	Y	09	0.20	08		1.0	1.6
REMOVABLE FAIRING/COWLING		34		24		16									09			2.1
110305 67020 67W20 68G20	4	020		070		106		40	7.3	16.7	0.0	Y	09	0.05	08		0.5	1.1
REMOVABLE ACCESS PANEL		30		18		12									09			1.6
110400																		
COCKPIT/CABIN INTERIOR SUBSYS																		
110401 67020 67W20 68G20	62	106		093		190		7	0.0	0.0	0.0	N		0.0	09		2.0	0.7
INSTRUMENT CONSOLE		57		10		13												0.8
110402 67020 67W20 68G20	2	106						5	0.0	0.0	0.0	Y	09	0.40	09		2.0	0.2
EQUIPMENT RACK		100		0		0							10					0.2
110403 67020 67W20 68G20	10	540		106		760		73	1.0	2.7	64.9	Y	09	0.10	09		1.5	2.7
FLOOR PANEL		19		5		4												5.9
110404 67020 67W20 68G20	7	070		135		190		0	0.0	0.0	0.0	N		0.0	09		1.0	0.8
SEAT TRACK		50		25		25												1.0
110500																		
ENG COMPARTMENT/TUNNEL SUBSYS																		
110501 67020 67W20 68G20	49	190		020		106		37	0.0	0.0	0.0	N		0.0	09		2.0	2.1
FIREWALL		52		20		7												3.1
110502 67020 67W20 68G20	3	190		070		760		76	0.0	0.0	0.0	N		0.0	09		0.3	0.5
SCUPPER/DRAIN		52		9		9												1.0
110503 67020 67W20 68G20	8	127		135		437		77	0.0	0.0	0.0	N		0.0	09		1.0	1.5
HANGER BRG SUPPT STRUCTURE		33		22		22												1.5
110600																		
FITTING/HARDPOINT SUBSYSTEM																		

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
110601 67020 67W20 68G20	4	190		105		020		22	0.0	0.0	0.0	Y	09	0.10	09		0.5	2.5
ENGINE FITTING		35		24		22												5.0
110602 67020 67W20 68G20	29	190		020		070		94	0.0	0.0	0.0	N		0.0	09		1.0	1.6
TRANSMISSION/GEARBOX FITTING		50		25		10												2.1
110603 67020 67W20 68G20	15	106		105		167		15	6.3	7.8	0.0	N		0.0	09		3.0	1.3
TAIL BOOM ATTACH FITTING		22		17		17									12			2.1
110604 67020 67W20 68G20	2	020		730		170		84	0.0	0.0	0.0	N		0.0	09		0.5	2.0
LANDING GEAR FITTING		33		33		17												2.4
110605 67020 67W20 68G20	2	020						25	0.0	0.0	0.0	N		0.0	09		0.5	2.0
CARGO HOOK FITTING		100		0		0												4.0
110606 67020 67W20 68G20	2	070						0	0.0	0.0	0.0	Y	09	0.10	09		0.5	0.8
ARMAMENT FITTING		100		0		0									11			0.8
120000																		
FUSELAGE COMPARTMENT SYSTEM																		
120100																		
COCKPIT SUBSYSTEM																		
120101 67020 67W20 68G20	62	106		093		190		7	0.0	0.0	0.0	N		0.0	09		2.0	0.7
INSTRUMENT PANEL		57		10		10												0.8
120102 67020 67W20 67020	34	190		070		266		16	22.2	33.3	99.9	N		0.0	09		1.0	0.8
GLARE SHIELD		60		20		10												0.8
120103 67020 67W20 68G20	13	780		105		381		0	0.0	0.0	0.0	N		0.0	09		2.0	0.5
OVERHEAD PANEL		50		25		25												0.5
120104 67020 67W20 67020	132	730		106		124		12	4.2	5.3	0.0	N		0.0	09		2.0	0.9
PILOT/COPILOT SEAT/CUSHION		20		17		14												1.1
120105 67020 67W20 67020	6	135		410		780		107	0.0	0.0	0.0	N		0.0	08	10	4.0	0.6
SEAT ADJUSTMENT MECHANISM		33		33		33									09			0.6
120106 67020 67W20 67020	16	932		105		135		0	10.1	11.3	0.0	Y	08	0.20	08		3.0	0.4
INERTIA REEL		33		25		17									09			0.4
120107 67020 67W20 67020	17	932		127		070		0	0.0	0.0	0.0	Y	09	0.20	09		1.0	0.5
SHOULDER HARNESS/LAP BELT		24		19		14												0.6
120108 67020 67W20 67020	2	070						0	0.0	0.0	0.0	Y	09	0.10	09		0.8	1.5
ARMOR PLATE SET		100		0		0							10					1.5
120109 67020 67W20 67020	6	135		410		780		107	0.0	0.0	0.0	Y	09	0.10	08		3.0	0.6
ARMR PLT QUICK RELEASE MECHNSM		33		33		33									09			0.6

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC MOS 1 MOS 2 MOS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT 'RB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
120110 67020 67W20 67020 RELIEF TUBE	4	070 33		127 17		242 17		0	0.0	0.0	0.0	N		0.0	09		3.0	0.5 0.6
120111 67020 67W20 68G20 MAP CASE	61	730 57		105 10		106 10		5	0.0	0.0	0.0	N		0.0	09		1.0	0.7 0.7
120112 67020 67W20 67020 SPARE LAMP STORAGE BOX	61	730 57		105 10		106 10		5	0.0	0.0	0.0	N		0.0	09		1.5	0.7 0.7
120200 CABIN SUBSYSTEM																		
120201 67020 67W20 67020 PASSENGER SEAT	6	947 63		127 21		730 4		44	0.0	0.0	0.0	N		0.0	09 10		1.5	1.3 2.0
120202 67020 67W20 67020 LAP BELT	5	020 100		 0		 0		160	0.0	0.0	0.0	Y	09	0.10	09		0.5	0.5 0.6
120203 67020 67W20 67020 INSULATION BLANKET PANEL	1	020 25		301 13		730 13		15	0.0	0.0	0.0	N		0.0	09		2.0	1.0 1.0
120204 67020 67W20 67020 BLOCK & TACKLE ASSY	4	070 33		540 33		 0		89	0.0	0.0	0.0	N		0.0	09		5.0	1.5 1.8
120300 RAMP ACTUATE/CONTROL SUBSYS																		
120301 67020 67W20 68H20 RAMP CONTROL PANEL	9	070 63		127 13		730 13		0	0.0	0.0	0.0	Y	08	0.10	08 09		2.0	0.7 0.7
120302 67020 67W20 68H20 RAMP ACTUATE CYLINDER & LOCK	89	381 86		780 8		020 2		40	10.2	18.7	75.4	Y	08	0.40	08 09		3.0	1.4 1.7
120400 HATCH DOOR ACTUATION SUBSYS																		
120401 67020 67W20 67020 HATCH DOOR ACTUATING CYLINDER	21	381 33		020 17		246 17		30	0.0	0.0	0.0	N		0.0	09		1.0	0.9 1.3
120402 67020 67W20 67020 HATCH DOOR LATCH	21	381 33		020 17		246 17		30	0.0	0.0	0.0	N		0.0	08		2.0	0.9 1.3
130000 LANDING GEAR SYSTEM																		
130100 MLG SKID TYPE SUBSYSTEM																		
130101 67020 67W20 67020 SKID TUBE	210	020 25		730 14		106 12		35	4.8	7.9	76.9	Y	09	0.10	09 10		2.0	2.7 6.1

WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
130102	67020	67W20	67020	42	020		106		730		39	0.0	0.0	0.0	Y	09	0.10	09		1.0	1.6
SKID TUBE SHOE					40		20		16												3.4
130103	67020	67W20	67020	70	780		020		106		10	2.5	4.3	0.0	Y	09	0.10	09	11	3.0	3.3
CROSS TUBE					20		18		16									10			7.4
130104	67020	67W20	67020	21	106		020		730		63	0.0	0.0	0.0	Y	09	0.10	09		1.5	0.8
CROSS TUBE SUPPORT					63		19		13									10			0.8
130105	67020	67W20	68G20	84	190		780		070		51	12.6	21.5	50.0	Y	09	0.10	09		1.0	1.1
STRUT FAIRING					48		14		11												1.3
130200																					
MLG OLEO TYPE SUBSYSTEM																					
130201	67020	67W20	68H20	131	381		525		374		23	6.1	11.6	29.7	Y	09	0.10	09		2.0	1.5
SHOCK STRUT					26		21		7									11			2.7
130202	67020	67W20	67020	75	381		020		230		43	4.6	9.7	0.0	Y	09	0.10	09		0.9	2.4
DRAG STRUT					72		4		4									10			5.2
130203	67020	67W20	67020	1	105						160	0.0	0.0	0.0	Y	09	0.10	09		1.5	1.3
SCISSORS ASSEMBLY					100		0		0												1.3
130204	67020	67W20	67020	41	730		660		070		44	12.1	19.7	99.9	Y	09	0.10	09		6.0	0.6
SHIMMY DAMPER ASSEMBLY					55		18		9									25			0.8
130205	67020	67W20	67020	51	070		135		585		22	1.9	3.5	0.0	Y	09	0.10	08		2.0	0.8
WHEEL LOCK					58		11		9									09			0.9
130207	67020	67W20	67020	329	020		782		230		210	1.7	3.3	35.9	Y	09	0.10	08	12	2.0	0.9
WHEEL & TIRE ASSEMBLY					23		12		17									09	16		1.2
130300																					
MLG BRAKE SUBSYSTEM																					
130301	67020	67W20	68H20	187	651		381		525		13	1.1	1.6	99.9	Y	04	0.10	08		1.5	0.8
POWER BRAKE MASTER CYLINDER					48		24		10							09		09			1.1
130302	67020	67W20	68H20	296	381		020		651		31	2.2	4.4	50.0	Y	04	0.10	08	10	2.0	1.2
BRAKE ASSEMBLY					64		13		10							09		09	11		1.8
130303	67020	67W20	67020	293	070		135		127		12	0.7	1.0	99.9	Y	04	0.10	08		1.3	0.9
PARKING BRAKE CONTROL					45		12		5									09			1.2
130304	67020	67W20	67020	90	020		410		127		19	6.9	11.7	9.0	N		0.0	08		4.0	1.2
PARKING BRAKE CABLE					41		21		8									09			1.7
130305	67020	67W20	67020	5	070		106		127		45	0.0	0.0	0.0	N		0.0	08		0.9	1.0
PARKING BRAKE LINKAGE/SPRING					54		25		11									09			1.0

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
130306 67020 67W20 68H20 PARKING BRAKE VALVE	2	020 100		0		0		0	0.0	0.0	0.0	N		0.0	08 09		0.8	1.5 1.5
130400 POWER STEERING SUBSYSTEM																		
130401 67020 67W20 68F20 RHEOSTAT	26	374 29		450 29		242 14		0	0.0	0.0	0.0	Y	04	0.20	08		1.3	0.9 1.6
130402 67020 67W20 68F20 ELECTRICAL HARNESS	26	127 29		374 29		070 14		20	0.0	0.0	0.0	N		0.0	08 09		1.5	0.9 1.7
130403 67020 67W20 68H20 POWER STEERING HYD UNIT	89	381 86		780 8		020 2		40	10.2	18.7	50.0	Y	04 09	0.10	08 09		1.5	1.4 1.7
130500 TAIL SKID SUBSYSTEM																		
130501 67020 57W20 67020 TAIL SKID SHOCK STRUT	45	020 33		070 25		780 25		67	0.0	0.0	0.0	Y	09	0.10	09		1.8	1.0 1.3
130502 67020 67W20 67020 TAIL SKID TUBE	79	730 25		190 21		106 17		29	10.4	15.2	0.0	Y	09 10	0.10	09		2.0	1.4 1.8
130503 67020 67W20 67020 TAIL SKID ACTUATOR	399	374 34		780 17		450 8		12	1.1	1.6	0.0	N		0.0	09		1.5	0.9 1.5
140000 FLIGHT CONTROLS SYSTEM																		
140100 COLLECTIVE PITCH CNTLS SUBSYS																		
140101 67020 67W20 67020 COLLECTIVE STICK ASSEMBLY	345	020 42		127 27		730 7		62	3.5	8.3	43.9	Y	08 09	0.20	08 09		5.0	1.5 2.0
140102 67020 67W20 67020 FRICTION BRAKE	214	127 64		135 29		230 5		3	2.5	2.5	0.0	Y	08	0.20	08		2.0	1.6 3.1
140103 67020 67W20 67020 TORQUE TUBE	4	127 100		0		0		0	4.2	6.5	0.0	Y	09 10	0.20	09 10	11	5.0	3.0 8.5
140104 67020 67W20 67020 PUSH-PULL ROD	26	020 47		127 26		170 6		73	5.1	7.3	33.0	Y	09 10	0.10	09 10	11	1.5	1.2 1.7
140105 67020 67W20 67020 CRANK/LEVER/ARM, ETC	35	020 57		127 18		585 9		22	11.4	22.7	32.9	Y	09 10	0.10	09 10	11	2.0	1.8 2.3
140106 67020 67W20 68F20 MAGNETIC BRAKE	119	135 42		901 12		450 11		6	0.0	0.0	0.0	N		0.0	09		0.8	1.9 3.7

WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
140107 DAMPER ASSEMBLY	67020	67W20	67020	39	242 23		135 19		020 12		37	2.0	2.4	0.0	N		0.0	09		1.0	1.1 1.2
140108 ENGINE DROOP ELIMINATOR UNIT	67020	67W20	68F20	2	135 100		0		0		0	0.0	0.0	0.0	N		0.0	09		1.5	2.5 5.0
140109 BOOT/SEAL	67020	67W20	67020	28	947 36		020 28		127 12		39	0.0	0.0	0.0	N		0.0	09		0.5	1.1 1.4
140200 CYCLIC CONTROLS SUBSYSTEM																					
140201 CYCLIC CONTROL STICK	67020	67W20	67020	123	127 28		070 13		135 9		7	4.3	4.3	50.0	Y	08 09	0.20	08 09		5.0	1.3 1.7
140202 STICK TRIM ACTUATOR	67020	67W20	68F20	1201	374 28		127 12		242 12		8	6.9	9.7	32.1	N		0.0	09		1.0	1.4 2.0
140203 LONGITUDINAL STICK POS INDCATR	67020	67W20	68F20	32	070 28		127 28		135 17		20	6.3	6.3	0.0	Y	09	0.10	09		0.5	1.2 1.0
140204 TORQUE TUBE	67020	67W20	67020	80	127 33		020 20		117 8		46	6.2	7.6	0.0	Y	09 10	0.20	09 10	11	5.0	1.7 2.2
140205 PUSH-PULL ROD	67020	67W20	67020	7	127 35		020 20		170 20		42	7.1	8.3	33.0	Y	09 10	0.10	09 10	11	1.5	1.2 1.6
140206 CRANK/LEVER/ARM, ETC	67020	67W20	67020	95	020 59		710 24		720 6		44	5.5	7.5	24.9	Y	09 10	0.10	09 10	11	2.0	1.8 2.3
140207 MAGNETIC BRAKE	67020	67W20	68F20	110	135 45		901 13		450 11		4	0.0	0.0	0.0	N		0.0	09		0.8	2.0 3.8
140208 FORCE GRADIENT ASSEMBLY	67020	67W20	67020	44	127 14		135 15		020 7		15	4.2	4.4	0.0	N		0.0	09		1.5	1.9 2.5
140209 LONGTDNL CYCLIC TRIM SPD ACTR	67020	67W20	68F20	345	381 36		135 23		127 9		18	7.2	9.0	0.0	N		0.0	09		1.0	2.0 3.2
140210 BOOT/SEAL	67020	67W20	67020	1	020 100		0		0		138	0.0	0.0	0.0	N		0.0	09		0.5	0.5 0.5
140300 CONTROLS MIXER SUBSYSTEM																					
140301 CONTROLS MIXER ASSEMBLY	67020	67W20	67020	45	020 47		105 16		730 10		132	7.8	11.7	0.0	Y	09 10	0.60	09 10	11 12	20.0	1.9 2.3
140400 MAST CONTROLS SUBSYSTEM																					

WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
140401 SWASHPLATE ASSEMBLY	67020	67W20	67020	420	020 32		127 30		730 14		21	11.6	14.6	41.5	Y	09 10	0.60	08 09	10 11	40.0	2.8 5.0
140403 SCISSOR & SLEEVE ASSEMBLY	67020	67W20	67020	774	020 64		710 9		730 7		62	5.4	9.8	25.1	Y	09 10	0.40	09 10	11 12	15.0	1.8 2.6
140404 LINK/ROD/LEVER, ETC	67020	67W20	67020	219	020 63		730 13		710 10		45	0.0	0.0	0.0	Y	09 10	0.10	09 10	11 12	1.5	2.1 3.3
140405 SWASHPLATE BOOT/SEAL	67020	67W20	67020	5	105 100		0		0		0	0.0	0.0	0.0	N		0.0	09		0.5	1.3 1.3
140406 SWASHPLATE ASSY (HEAVY HELO)	67020	67W20	67020	162	020 49		710 18		730 14		86	5.7	12.4	20.3	Y	09 10	0.90	08 09	10 11	50.0	2.8 7.5
140500 TAIL ROTOR CONTROLS SUBSYSTEM																					
140501 PEDAL ASSEMBLY	67020	67W20	67020	24	135 26		127 20		070 13		0	10.3	11.1	0.0	Y	08 09	0.10	08 09		1.0	1.1 1.3
140502 PEDAL ADJUSTMENT MECHANISM	67020	67W20	67020	23	127 35		135 21		070 14		10	7.7	10.0	0.0	N		0.0	09		1.5	1.6 1.8
140503 TAIL ROTOR TRIM ACTUATOR	67020	67W20	68F20	4	374 50		135 25		900 25		0	0.0	0.0	0.0	N		0.0	09		1.0	1.3 2.5
140504 PUSH-PULL ROD	67020	67W20	67020	2	381 40		020 20		127 20		28	5.5	7.0	33.0	Y	09 10	0.10	09 10	11	1.5	1.7 2.6
140505 CRANK/LEVER/ARM, ETC	67020	67W20	67020	21	020 41		127 26		710 9		57	2.5	3.8	20.0	Y	09 10	0.10	09 10	11	2.0	1.4 1.9
140506 MAGNETIC BRAKE	67020	67W20	68F20	45	135 28		381 14		051 14		10	7.7	7.7	33.0	N		0.0	09		0.8	1.6 2.7
140507 FORCE GRADIENT ASSEMBLY	67020	67W20	67020	13	020 50		127 25		135 25		69	0.0	0.0	0.0	N		0.0	09		1.5	2.8 4.0
140508 PULLEY	67020	67W20	67020	8	020 50		070 21		190 14		99	0.0	0.0	0.0	Y	09	0.10	09 26		1.0	1.0 1.1
140509 QUADRANT	67020	67W20	67020	13	070 50		170 25		710 25		138	0.0	0.0	0.0	Y	09	0.10	09 10	11	2.0	0.8 0.9
140510 CABLE ASSEMBLY/TURNBUCKLE	67020	67W20	67020	48	020 50		127 11		230 9		42	5.1	6.6	0.0	Y	09	0.15	09 13	26	7.0	1.1 1.6
140511 FAIRLEAD	67020	67W20	67020	8	020 50		127 25		780 13		99	0.0	0.0	0.0	N		0.0	09 26		0.5	1.0 1.1

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
140512	67020	67W20	67020	95	020		135		246		75	18.0	55.2	0.0	Y	09	0.10	09	26	5.0	1.3
CHAIN ASSEMBLY					68		11		7									11			1.7
140600																					
TAIL ROTOR PITCH CNTRL SUBSYS																					
140601	67020	67W20	68E20	299	020		730		710		64	8.0	13.0	0.0	Y	09	0.50	08	10	4.0	1.4
CROSS HEAD/STAR					73		7		0							10		09	11		1.5
140602	67020	67W20	68E20	172	127		020		170		30	3.8	4.6	33.4	Y	09	0.10	08	10	1.5	1.1
PITCH CHANGE LINK					50		34		5							10		09	11		1.2
140700																					
ELEVATOR CONTROLS SUBSYSTEM																					
140701	67020	67W20	67020	3	381		020		127		28	0.0	0.0	0.0	Y	09	0.10	09	11	1.5	1.7
PUSH-PULL ROD					40		20		20							10		10			2.6
140702	67020	67W20	67020	1	020		070				69	0.0	0.0	0.0	Y	09	0.10	09	11	1.5	1.6
CRANK/LEVER/ARM, ETC					50		50		0							10		10			3.6
140703	67020	67W20	67020	26	020		127		190		52	38.4	48.7	0.0	Y	09	0.20	09	11	5.0	3.3
TORQUE TUBE					38		25		13							10		10			4.8
140800																					
STABILITY AUGMENTATION SUBSYS																					
140801	67020	35K20	35K20	139	374		242		450		0	2.6	3.0	0.0	N		0.0	04		1.0	1.1
SAS GYRO					45		8		8									09			2.0
140802	67020	35K20	35K20	8	780		070		437		0	20.0	20.0	0.0	N		0.0	04		0.8	1.2
SAS TRANSDUCER					40		20		20												1.2
140803	67020	35K20	35K20	229	127		135		242		0	7.0	8.8	43.6	N		0.0	04		3.0	2.5
SAS CONTROL ACTUATOR					47		13		11									09			4.8
150000																					
ROTOR SYSTEM																					
150100																					
MAIN ROTOR SUBSYSTEM																					
150101	67020	67W20	68E20	189	190		780		731		13	13.5	22.9	58.0	Y	02	2.00	09	24	8.0	2.2
M.R. BLADE ASSEMBLY					30		19		8							09		11			5.1
150102	67020	67W20	68E20	17	020		127		135		55	32.0	89.0	0.0	Y	09	0.10	09		0.9	0.9
DRAG BRACE					20		20		20												1.3
150103	67020	67W20	68E20	114	127		190		381		16	6.1	14.5	2.3	Y	09	0.10	09		1.5	1.5
DAMPER ASSEMBLY					16		12		11												3.1

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
150104 DAMPER RESERVOIR	67020	67W20	68E20	15	381 100		0		0		20	0.0	0.0	0.0	Y	09	0.20	09		2.0	0.8 1.3
150105 DAMPER HOSE	67020	67W20	68E20	1	381 100		0		0		35	0.0	0.0	0.0	Y	09	0.05	09		0.3	1.0 2.0
150106 PITCH VARYING HOUSING/ASSY	67020	67W20	68E20	36	020 32		730 14		410 9		44	2.2	3.1	15.0	Y	08 09	0.20	09 11		4.0	1.6 2.5
150107 TENSION-TORSION STRAP SET	67020	67W20	68E20	2	246 100		0		0		0	0.0	0.0	0.0	N		0.0			0.0	1.8 2.9
150108 HUB ASSEMBLY	67020	67W20	68E20	491	020 24		127 13		190 9		5	3.5	5.3	35.0	Y	09	0.20	09		4.0	2.9 6.4
150109 HUB OIL RESERVOIR	67020	67W20	68E20	7	381 55		410 18		660 18		29	0.0	0.0	0.0	Y	09	0.10	09		0.5	1.3 2.0
150111 CENTRIFUGAL DROOP STOP ASSY	67020	67W20	68E20	26	020 22		070 17		190 14		39	4.9	13.2	0.0	Y	08 09	0.10	03 11		4.0	1.6 2.3
150112 ANTI-FLAP RESTRAINER	67020	67W20	68E20	6	135 33		230 17		410 17		0	11.1	20.0	0.0	Y	08 09	0.10	08 09		1.0	0.7 0.7
150113 PITCH HORN	67020	67W20	68E20	5	020 67		106 33		0		92	0.0	0.0	0.0	Y	09	0.10	09		1.0	0.9 0.9
150114 PITCH LINK	67020	67W20	68E20	495	127 41		020 39		710 9		33	2.7	3.6	19.1	Y	09 10	0.10	09 10	11	1.5	1.1 1.4
150115 K BAR	67020	67W20	68E20	52	710 50		105 30		135 5		75	0.0	0.0	0.0	Y	09	0.10	09 10	11	1.0	3.0 4.2
150116 CONTROL TUBE/ROD	67020	67W20	67020	31	020 39		106 25		127 14		54	9.5	14.9	0.0	Y	09 10	0.10	09 10	11	1.5	1.1 1.4
150117 STABILIZER BAR ASSEMBLY	67020	67W20	68E20	740	020 41		710 9		190 7		39	6.5	12.3	32.7	Y	09 10	0.20	09		6.0	1.3 1.7
150118 STABILIZER DAMPER	67020	67W20	68E20	437	020 53		127 15		381 6		89	0.0	0.0	0.0	Y	09	0.10	09 12	27	6.0	1.2 1.5
150119 ROTARY WING HEAD FAIRING	67020	67W20	68G20	45	730 50		105 17		381 17		54	0.0	0.0	0.0	Y	09	0.10	09 10		1.0	1.8 2.6
150120 SAND DEFLECTOR	67020	67W20	68G20	45	730 50		106 17		381 17		54	0.0	0.0	0.0	Y	09	0.10	09		1.0	0.9 1.3
150121 BOOT/COVER	67020	67W20	67020	27	947 63		020 11		106 9		132	2.9	18.0	0.0	N		0.0	09		0.5	1.3 1.7

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
150122 67020 67W20 68E20 PITCH VARY HSG/ASSY (HVY HELO)	531	020 25		381 10		374 10		85	4.6	10.6	31.2	Y	08 09	0.30	09 11		5.0	1.7 3.3
150123 67020 67W20 68E20 HUB ASSEMBLY (HEAVY HELO)	291	381 32		127 19		070 7		28	9.2	16.3	37.4	Y	09	0.40	09		8.0	3.0 9.0
150200 TAIL ROTOR SUBSYSTEM																		
150201 67020 67W20 68E20 T.R. BLADE ASSEMBLY	272	780 38		731 19		425 17		16	12.3	19.2	11.9	Y	09	0.50	09 11	24	4.0	1.1 1.2
150202 67020 67W20 68E20 SLEEVE & SPINDLE ASSEMBLY	175	381 39		386 20		410 11		13	1.9	6.7	64.8	Y	08 09	0.20	09		2.5	1.7 3.9
150203 67020 67W20 68E20 HUB ASSEMBLY	761	710 56		020 7		190 7		34	5.3	7.0	24.4	Y	09	0.10	09 12		3.0	1.4 1.6
150204 67020 67W20 68E20 OIL RESERVOIR	15	381 100		0		0		20	0.0	0.0	0.0	Y	09	0.10	09		0.5	0.8 1.3
220000 TURBOSHAFT ENGINE SYSTEM																		
220100 ENGINE ASSEMBLY SUBSYSTEM																		
220101 67020 67W20 68B20 ENGINE ASSEMBLY	346	381 8		127 4		301 2		9	13.0	16.6	30.6	Y	09	2.00	04 06	09 10	212.0	2.3 5.3
220200 ENG REPLACBLE COMPNENTS SUBSYS																		
220201 67020 67W20 68B20 COMBUSTION CASE FUEL DRAIN VLV	5	437 100		0		0		142	0.0	0.0	0.0	N		0.0	09		3.0	0.5 1.0
220202 67020 67W20 67020 EXHAUST EJECTOR	13	190 50		730 50		0		0	0.0	0.0	0.0	N		0.0	09		2.0	3.3 5.4
220203 67020 67W20 67020 INSULATION BLANKET	1	070 100		0		0		0	0.0	0.0	0.0	N		0.0	09		1.5	0.5 0.5
220204 67020 67W20 67020 FIRESHIELD	43	190 37		106 24		947 9		70	3.3	8.9	0.0	N		0.0	09		1.0	2.1 2.9
220300 ENGINE FUEL SUBSYSTEM																		
220301 67020 67W20 68B20 FUEL CONTROL ASSEMBLY	177	127 54		242 10		230 6		2	3.7	4.0	50.0	N		0.0	04 09	11	10.0	1.7 2.1

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
220302 FUEL CONTROL STRAINER	67020	67W20	67020	10	230 67		070 33		 0		46	0.0	0.0	0.0	N		0.0	09 12		10.0	1.0 1.0
220303 SERVO FILTER	67020	67W20	67020	11	230 33		306 17		381 17		59	0.0	0.0	0.0	N		0.0	04 09		10.0	0.7 0.8
220305 OVERSPEED GOVERNOR	67020	67W20	68B20	152	381 41		127 12		315 8		3	8.6	13.5	36.1	N		0.0	09		2.0	1.1 1.3
220306 FUEL BOOST PUMP	67020	67W20	68B20	10	230 67		190 33		 0		92	0.0	0.0	0.0	N		0.0	04 09	12	1.0	1.0 1.0
220307 FUEL FILTER	67020	67W20	67020	11	230 33		306 17		381 17		59	0.0	0.0	0.0	Y	01 09	0.10	04 09	12	10.0	0.7 0.8
220308 FUEL HEATER	67020	67W20	68B20	35	230 18		730 18		037 9		10	0.0	0.0	0.0	N		0.0	09		2.0	1.4 3.5
220309 FLOW DIVIDER ASSEMBLY	67020	67W20	68B20	72	780 33		381 18		317 9		64	29.4	40.7	26.8	Y	09	0.10	09		1.5	2.2 3.7
220310 MAIN & STARTING FUEL MANIFOLD	57020	67W20	68B20	55	381 59		127 12		730 14		8	25.1	33.4	50.0	Y	09	0.10	04 09		2.0	3.0 6.0
220311 LINE/HOSE	67020	67W20	68B20	19	381 45		020 15		730 12		31	21.2	43.1	0.0	Y	09	0.05	04 09		0.3	1.2 1.2
220400 ENGINE LUBRICATION SUBSYSTEM																					
220401 OIL TANK	67020	67W20	68B20	72	381 50		106 9		730 9		31	5.7	14.0	0.0	Y	09	0.20	09		3.0	1.2 1.4
220402 OIL STRAINER	67020	67W20	67020	10	230 67		070 33		 0		46	0.0	0.0	0.0	N		0.0	09 12		10.0	1.0 1.0
220403 OIL FILTER	67020	67W20	67020	13	730 50		190 25		381 25		35	0.0	0.0	0.0	Y	01 09	0.10	09 12		10.0	0.6 0.7
220404 LIQ-TO-LIQ OIL COOLER	67020	67W20	68B20	7	190 50		070 25		381 13		39	0.0	0.0	0.0	Y	09	0.10	08 09		1.5	1.7 2.2
220405 LINE/HOSE	67020	67W20	68B20	7	381 46		730 19		111 9		35	9.3	13.9	0.0	Y	09	0.05	04 09		0.3	0.7 0.9
220500 ENGINE ELECTRICAL SUBSYSTEM																					
220501 TEST SWITCH	67020	67W20	68F20	48	070 40		374 13		135 7		0	0.0	0.0	0.0	N		0.0	08		1.0	1.2 1.3

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
220502 67020 67W20 68B20	16	070		190		450		15	0.0	0.0	0.0	N		0.0	08		1.5	1.5
ELECTRICAL HARNESS ASSEMBLY		20		20		20									09			1.7
220503 67020 67W20 68B20	114	070		020		615		12	9.4	12.1	0.0	N		0.0	09		5.0	1.3
FIRE DETECTOR ELEMENT		34		14		11									23			2.1
220600																		
ENGINE IGNITION SUBSYSTEM																		
220601 67020 67W20 68B20	52	374		070		958		0	31.3	41.8	0.0	N		0.0	08		1.0	1.7
IGNITION EXCITER		44		13		13									09			3.0
220602 67020 67W20 68B20	6	020		070				0	0.0	0.0	0.0	N		0.0	08		2.0	1.5
IGNITION HARNESS		50		50		0									09			1.7
220603 67020 67W20 68B20	15	242		900		020		38	14.9	24.6	0.0	N		0.0	05		4.0	1.7
IGNITER PLUG		28		22		11												3.0
220700																		
BLEED AIR SUBSYSTEM																		
220701 67020 67W20 68B20	6	374						0	0.0	0.0	0.0	N		0.0	09		2.0	1.6
ANTI-ICING PROBE		100		0		0												2.1
220702 67020 67W20 68B20	10	127						0	0.0	0.0	0.0	N		0.0	09		10.0	1.2
AIRBLEED ACTUATOR/STRAINER		100		0		0									12			1.5
220703 67020 67W20 68B20	35	230		730		037		0	0.0	0.0	0.0	N		0.0	09		0.8	1.4
AIR VALVE ASSEMBLY		18		18		9												3.5
220704 67020 67W20 68B20	12	660		020		242		22	0.0	0.0	0.0	N		0.0	09		0.3	1.1
LINE/HOSE		26		14		10												1.6
240000																		
AUXILIARY POWER PLANT SYSTEM																		
240100																		
APP ENGINE ASSEMBLY SUBSYSTEM																		
240101 67020 67W20 68B20	26	464		190		374		74	0.0	0.0	0.0	Y	09	0.30	09	12	53.0	3.4
APP ENGINE ASSEMBLY		20		20		10									11			4.9
240200																		
APP REPLACEABLE COMPNT SUBSYS																		
240201 67020 67W20 68B20	7	070		947				89	0.0	0.0	0.0	Y	09	0.10	09		1.5	0.9
AIR INLET SCREEN		50		50		0									12			0.9
240202 67020 67W20 68G20	14	020		011		070		44	0.0	0.0	0.0	Y	09	0.10	09		1.5	0.9
AIR INLET DUCT		25		25		13									12			0.9

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WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
240204 INSULATION BLANKET	67020	67W20	67020	1	070 100		0		0		0	0.0	0.0	0.0	N		0.0	09		1.5	0.5 0.5
240300 APP FUEL SUBSYSTEM																					
240301 FUEL CONTROL ASSEMBLY	67020	67W20	68B20	116	127 39		177 13		242 10		14	0.0	0.0	0.0	N		0.0	09		4.0	1.5 2.7
240302 ACCELLERATION CONTROL ASSY	67020	67W20	68B20	77	127 43		242 16		317 9		8	7.2	20.0	33.9	N		0.0	09		2.0	2.4 4.0
240303 RATED SPEED CONTROL ASSY	67020	67W20	68B20	15	374 75		450 25		0		80	0.0	0.0	0.0	N		0.0	09		2.0	0.8 1.1
240304 FUEL BOOST PUMP	67020	67W20	68B20	76	242 36		374 17		177 10		55	16.2	37.7	40.4	N		0.0	09		1.0	1.6 2.3
240305 FUEL FILTER	67020	67W20	67020	7	230 75		242 25		0		99	50.0	50.0	0.0	Y	01 09	0.10	09 12		10.0	1.7 2.0
240306 PRESSURE SWITCH	67020	67W20	68B20	11	070 33		106 33		104 33		16	0.0	0.0	0.0	N		0.0	09		0.8	0.5 0.5
240307 FUEL SHUTOFF VALVE	67020	67W20	68B20	14	070 25		177 25		242 25		44	32.2	65.7	50.0	N		0.0	09		0.8	1.5 2.0
240308 LINE/HOSE	67020	67W20	68B20	3	381 60		177 20		190 20		35	40.0	99.9	50.0	Y	09	0.05	09		0.3	0.9 1.4
240400 APP LUBRICATION SUBSYSTEM																					
240401 OIL RESERVOIR	67020	67W20	68B20	2	381 100		0		0		20	50.0	99.9	0.0	Y	09	0.20	09		3.0	1.5 2.1
240402 OIL FILTER	67020	67W20	67020	13	730 50		190 25		381 25		35	0.0	0.0	0.0	Y	01 09	0.10	09 12		10.0	0.6 0.7
240403 OIL RELIEF VALVE	67020	67W20	68B20	20	108 33		190 33		561 33		0	33.3	33.3	66.0	N		0.0	08		0.5	0.7 0.7
240404 LINE/HOSE	67020	67W20	68B20	3	381 60		177 20		190 20		35	40.0	99.9	50.0	Y	09	0.05	09		0.3	0.9 1.4
240500 APP CONTROL SUBSYSTEM																					
240501 START SWITCH	67020	67W20	68F20	12	117 43		106 14		160 14		25	0.0	0.0	0.0	N		0.0	09		1.3	0.9 1.1

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
240502	67020	67W20	68F20	5	374		567		901		0	0.0	0.0	0.0	N		0.0	09		0.8	1.0
RELAY					33		33		33												1.4
240503	67020	67W20	68B20	48	374		127		450		0	0.0	0.0	0.0	N		0.0	09		0.8	2.1
SPEED CONTROL SWITCH					23		15		15												2.6
240600																					
APP IGNITION SUBSYSTEM																					
240601	67020	67W20	68B20	15	255		020		070		0	10.0	50.0	0.0	N		0.0	09		1.0	1.9
IGNITION UNIT					18		9		9												2.5
240602	67020	67W20	68B20	14	374		255		169		0	15.8	99.1	0.0	N		0.0	09		1.0	1.5
EXCITER					38		25		13												2.5
240603	67020	67W20	68B20	4	070		080				0	0.0	0.0	0.0	N		0.0	09		3.0	0.8
IGNITION HARNESS					50		50		0									12			0.8
240604	67020	67W20	68B20	37	242		615		900		9	20.0	39.9	0.0	N		0.0	09		3.0	1.3
IGNITER PLUG					24		14		14									12			2.4
240700																					
APP HYDRAULIC SUBSYSTEM																					
240701	67020	67W20	68H20	377							21	7.9	26.9	28.6	Y	09	0.10	09		2.0	1.5
HYDRAULIC PUMP MOTOR					0		0		0												2.1
240702	67020	67W20	68H20	7	093		381				80	0.0	0.0	0.0	N		0.0	09		2.5	1.3
HAND PUMP					50		50		0												1.3
240703	67020	67W20	69H20	158	381		525		651		15	2.5	8.1	12.2	Y	09	0.10	09		3.0	2.0
ACCUMULATOR					59		14		5												2.8
240704	67020	67W20	68H20	60	381		374		242		30	7.5	50.0	0.0	N		0.0	09		0.8	1.9
SOLENOID VALVE					81		13		6												3.2
240705	67020	67W20	67020	40	381		020		111		59	0.0	0.0	0.0	Y	09	0.05	09		0.3	1.2
LINE/HOSE					69		8		4												1.7
240800																					
APP INSTRUMENT SUBSYSTEM																					
240801	67020	67W20	68B20	5	070		127		567		0	0.0	0.0	0.0	N		0.0	09		3.0	2.4
THERMOCOUPLE					33		33		33									12			4.4
240802	67020	67W20	68B20	7	730		958				80	0.0	0.0	0.0	N		0.0	09		0.5	2.0
HOURMETER					50		50		0												3.0
240900																					
APP ENGINE MOUNT SUBSYSTEM																					

WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
240901 TUBULAR MOUNT	67020	67W20	67020	11	020 50		780 25		127 3		92	0.0	0.0	0.0	N		0.0	09		4.0	3.9 6.3
240902 RUBBER SHOCK MOUNT	67020	67W20	67020	7	020 50		070 50		0		25	0.0	0.0	0.0	N		0.0	09		1.0	2.8 5.1
260000 DRIVES - TRANSMISSION SYSTEM																					
260100 MAIN XMSN DRIVES SUBSYSTEM																					
260101 ENGINE DRIVE SHAFT	67020	67W20	68D20	324	020 41		381 22		127 8		61	9.1	14.7	0.0	Y	09	0.20	09 12		6.0	2.0 2.8
260102 SHAFT COUPLING - THOMAS TYPE	67020	67W20	68D20	5	780 46		381 28		135 17		59	50.0	50.0	12.2	Y	09 10	0.30	09 11		2.5	1.2 1.6
260103 SHAFT COUPLING-ZURN TYPE	67020	67W20	68D20	47	020 24		106 16		127 15		57	0.0	0.0	0.0	Y	09	0.20	09		2.0	1.5 1.6
260104 SHAFT TO COUPLING CLAMP	67020	67W20	68D20	11	020 57		127 11		092 5		94	0.0	0.0	0.0	Y	09	0.10	09 10	11 12	3.0	1.5 2.2
260105 HANGER BEARING	67020	67W20	68D20	132	020 44		710 23		381 10		102	1.8	3.3	0.0	Y	09	0.10	09 10		2.0	1.8 2.0
260106 BEARING SHOCK MOUNT	67020	67W20	68D20	1	230 50		381 50		0		160	0.0	0.0	0.0	Y	09	0.10	09 10		1.5	2.3 2.3
260107 ENG/SYNC DRIVE SHFT (HVY HELO)	67020	67W20	68D20	55	020 10		070 5		730 3		47	10.0	16.6	24.0	Y	09	0.20	09 12		6.0	2.2 5.2
260200 TAIL ROTOR/AUX POWER DR SUBSYS																					
260201 T.R./AUX POWER PLANT SHAFT	67020	67W20	68D20	32	020 42		780 19		935 17		94	12.9	19.8	33.4	Y	09	0.20	09		6.0	1.2 1.5
260202 SHAFT COUPLING - THOMAS TYPE	67020	67W20	68D20	7	070 22		780 16		410 12		78	4.8	29.0	0.0	Y	09 10	0.30	09 11		2.5	0.8 1.0
260203 SHAFT COUPLING - ZURN TYPE	67020	67W20	68D20	44	020 44		710 23		381 10		102	1.8	3.3	0.0	Y	09	0.20	09		2.0	1.8 2.0
260204 SHAFT TO COUPLING CLAMP	67020	67W20	68D20	11	020 57		127 11		092 5		94	0.0	0.0	0.0	Y	09	0.10	09 10	11 12	3.0	1.5 2.2
260205 HANGER BEARING	67020	67W20	68D20	132	020 44		710 23		381 10		102	1.8	3.3	0.0	Y	09	0.10	09 10		2.0	1.8 2.0

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
260206 67020 67M20 68D20 VISCOUS DAMPER	1	230 50		381 50		 0		160	0.0	0.0	0.0	Y	09	0.10	09		0.8	2.3 2.3
260300 MAIN ROTOR DRIVE SUBSYSTEM																		
260301 67020 67M20 68D20 ROTOR DRIVE SHAFT & HSG ASSY	83	381 14		780 9		020 8		27	7.7	14.9	25.0	Y	09	0.20	09		14.0	3.9 7.8
260302 67020 67M20 67020 RDS MAGNETIC CHIP DETECTOR	27	070 42		730 19		306 6		12	3.5	4.6	0.0	N		0.0	09		4.0	0.3 1.0
260400 FAN DRIVES SUBSYSTEM																		
260401 67020 67M20 68D20 FAN DRIVE SHAFT ASSEMBLY	46	020 15		190 15		105 12		27	8.9	15.2	50.0	Y	09 10	0.20	09 10	12	6.0	1.7 2.0
260402 67020 67M20 67020 DRIVE BELT	48	020 50		127 11		230 9		42	5.1	6.6	50.0	Y	09 10	0.10	09		1.0	0.5 0.5
260403 67020 67M20 67020 DRIVE BELT PULLEY	8	020 50		070 21		190 14		70	0.0	0.0	0.0	N		0.0	09		1.0	1.0 1.1
260500 SEPARATE CLUTCH UNIT SUBSYS																		
260501 67020 67M20 68D20 FREE WHEELING ASSY	398	381 92		070 3		374 3		2	11.7	21.9	0.0	N		0.0	09		4.0	2.8 4.0
260502 67020 67M20 67020 MAG CHIP DETECTOR	44	070 48		730 24		306 8		7	4.2	5.6	0.0	N		0.0	09		4.0	0.6 0.7
260503 67020 67M20 68D20 AUX POWER PLANT SHAFT CLUTCH	1208	020 55		381 12		127 12		12	3.7	17.2	5.9	Y	09	0.20	09		3.0	2.2 3.3
260600 TRANSMISSION/GEARBOX SUBSYSTEM																		
260601 67020 67M20 68D20 ENGINE TRANSMISSION ASSY	13	372 43		381 29		306 14		20	29.3	28.3	50.0	Y	09	0.70	09 12		14.0	3.2 7.4
260602 67020 67M20 68D20 COMBINING TRANSMISSION ASSY	117	381 55		947 5		106 5		50	6.5	8.8	23.8	Y	09	1.50	09 12		25.0	2.5 5.4
260603 67020 67M20 68D20 MAIN ROTOR TRANSMISSION ASSY	581	381 42		020 15		730 6		25	4.1	5.8	25.0	Y	09	1.50	09 12		22.0	3.6 7.1
260604 67020 67M20 68D20 INTERMEDIATE GEARBOX ASSY	249	381 35		020 13		230 8		37	11.1	16.6	66.7	Y	09	0.70	09 12		14.0	1.5 1.8

MUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
260605 TAIL ROTOR GEARBOX ASSY	67020	67W20	68D20	574	381 19		020 19		916 10		21	12.0	17.5	44.1	Y	09	1.00	09 11	12	27.0	1.7 2.4
260606 M.R. TRANSMISSION (HVY HELO)	67020	67W20	68D20	196	381 22		070 9		106 7		22	9.7	12.6	45.0	Y	09	2.00	09 12		26.0	5.6 17.7
260607 INT GEARBOX ASSY (HEAVY HELO)	67020	67W20	68D20	85	381 34		372 27		070 7		21	19.7	24.8	54.1	Y	09	0.90	09 12		18.0	2.3 5.4
260608 T.R. GEARBOX ASSY (HEAVY HELO)	67020	67W20	68D20	108	381 15		108 13		070 9		84	0.0	0.0	0.0	Y	09	1.20	09 11	12	35.0	2.4 7.0
260700 TRANSMISSION OIL SUBSYSTEM																					
260701 OIL TANK	67020	67W20	67020	23	730 25		230 20		070 17		29	0.0	0.0	0.0	Y	09	0.20	09		3.0	0.7 0.7
260702 OIL PUMP	67020	67W20	67020	13	381 41		374 18		242 9		48	19.3	24.6	33.1	Y	09	0.10	09 12		4.0	2.2 2.9
260703 PRESSURE RELIEF VALVE	67020	67W20	67020	2	381 43		290 14		230 14		0	42.9	50.1	0.0	N		0.0	08		0.5	0.9 1.0
260704 OIL FILTER	67020	67W20	67020	2	105 100		0		0		35	0.0	0.0	0.0	Y	01 09	0.10	09 12		10.0	0.6 0.7
260705 OIL COOLER	67020	67W20	67020	65	070 30		381 25		020 15		7	10.6	18.2	50.0	Y	09	0.10	09		1.5	1.5 1.6
260706 THERMOSTATIC VALVE	67020	67W20	67020	10	127 33		230 33		381 33		0	0.0	0.0	0.0	N		0.0	08		0.5	0.8 0.8
260707 LINE/HOSE	67020	67W20	67020	5	381 38		127 23		020 20		35	26.0	41.0	12.0	Y	09	0.05	09		0.3	1.6 2.2
260800 MOUNTS SUBSYSTEM																					
260801 PYLON MOUNT ASSEMBLY	67020	67W20	67020	256	020 70		117 10		190 4		60	0.0	0.0	0.0	Y	09	0.20	09		20.0	3.2 4.6
260802 DAMPER	67020	67W20	67020	21	020 48		117 16		135 7		40	0.0	0.0	0.0	Y	09	0.10	09		1.0	3.6 6.1
260803 LIFT LINK	67020	67W20	67020	73	020 59		127 9		660 9		44	6.3	10.7	0.0	Y	09 10	0.10	09 10		3.0	1.3 1.7
260804 TUBULAR MOUNT ASSY	67020	67W20	67020	13	020 20		246 20		730 20		28	0.0	0.0	0.0	N		0.0	09		4.0	5.0 6.8

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
260900 ROTOR BRAKE SUBSYSTEM																					
260901 BRAKE ASSEMBLY	67020	67W20	68H20	203	020 50		127 11		381 5		24	6.7	13.1	0.0	Y	01 09	0.10	08 09	11	2.0	2.3 5.0
260902 DISC	67020	67W20	68D20	7	020 100		0		0		12	0.0	0.0	0.0	Y	09	0.10	08 09	11 12	4.0	2.7 5.5
260903 LINE/HOSE	67020	67W20	67020	48	242 28		381 19		374 16		38	3.3	8.7	0.0	Y	09	0.05	08 09		0.3	1.4 2.3
260904 SWITCH	67020	67W20	68F20	59	070 19		037 13		127 13		0	6.3	8.4	99.9	N		0.0	08		1.3	0.9 1.5
260905 THROTTLE INTERLOCK	67020	67W20	68F20	59	070 19		037 13		127 13		0	6.3	8.4	99.9	N		0.0	08		0.8	0.9 1.5
260906 SOLENOID	67020	67W20	68F20	683	374 26		901 13		242 10		7	8.7	14.3	0.0	N		0.0	08		0.8	1.0 1.4
260907 WIRING	67020	67W20	68F20	26	127 29		374 29		070 14		20	0.0	0.0	0.0	N		0.0	08 09		1.5	0.9 1.7
290000 POWER PLANT INSTALLATION SYS																					
290100 ENG MOUNT/SUSPENSION SUBSYS																					
290101 ENGINE MOUNT	67020	67W20	67020	65	020 35		710 25		730 17		60	8.1	19.8	0.0	Y	09	0.07	09 19		2.0	1.6 2.4
290102 ENGINE MOUNT BEARING	67020	67W20	67020	28	020 74		710 16		730 10		48	8.1	23.3	0.0	Y	09	0.07	09 11		1.5	1.5 1.7
290103 TORQUE SENSOR	67020	67W20	67020	30	710 50		037 15		425 4		50	7.5	15.0	0.0	Y	09	0.20	09		3.0	2.2 3.7
290200 ENG AIR PARTCLE SEPARTR SUBSYS																					
290201 PARTICLE SEPARATOR ASSY	67020	67W20	67020	117	070 15		190 15		230 15		87	0.0	0.0	0.0	Y	09	0.30	08 09	11	8.0	1.5 1.6
290202 DOOR ACTUATOR	67020	67W20	67020	93	127 36		242 12		374 12		13	0.0	0.0	0.0	N		0.0	08 09		1.5	1.8 3.2
290203 CABLE ASSEMBLY	67020	57W20	67020	96	020 43		127 11		230 9		42	5.1	6.6	0.0	N		0.0	08 09		4.0	1.1 1.6

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WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TDS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
290204 PULLEY	67020	67W20	67020	12	020 50		070 21		190 14		99	0.0	0.0	0.0	N		0.0	08 09		1.0	1.0 1.1
290205 CONTROL LEVER	67020	67W20	67020	50	070 45		135 12		127 5		50	0.7	1.0	99.9	N		0.0	08		1.5	0.9 1.2
290206 PRESSURE SWITCH	67020	67W20	68F20	11	070 33		106 33		108 33		16	0.0	0.0	0.0	N		0.0	08		0.8	0.5 0.5
290207 WIRING HARNESS	67020	67W20	68F20	2	070 100		0		0		15	0.0	0.0	0.0	N		0.0	08 09		1.5	0.5 0.5
290208 PARTICLE SEP ASSY (HEAVY HELO)	67020	67W20	67020	959	947 30		190 8		106 6		77	1.6	4.4	54.6	Y	09	0.50	08 09	11	10.0	1.4 1.7
290300 AIR INDUCTION SUBSYSTEM																					
290301 INLET SCREEN	67020	67W20	67020	39	230 33		070 25		947 17		46	0.0	0.0	0.0	Y	09	0.10	09		2.0	1.0 1.2
290302 INLET DUCT/PLENUM CHAMBER	67020	67W20	68G20	374	190 43		106 18		105 5		60	1.4	3.9	0.0	Y	09	0.10	09		2.0	1.7 1.9
290303 ALTERNATE AIR BYPASS DOOR	67020	67W20	68G20	15	070 75		190 13		565 6		0	0.0	0.0	0.0		08 09	0.10	09		1.5	2.3 3.3
290400 AIRCRAFT EXHAUST SUBSYSTEM																					
290401 TAILPIPE	67020	67W20	68G20	13	190 100		0		0		69	50.0	50.0	0.0	Y	09	0.10	09		2.0	0.7 0.8
290402 TAILPIPE ADAPTER/EXTENSION	67020	67W20	68G20	22	190 75		730 12		105 5		52	20.0	35.0	0.0	Y	09	0.10	09		1.5	0.7 0.8
290403 TAILPIPE CLAMP/COUPLING	67020	67W20	67020	10	106 33		167 33		730 33		0	0.0	0.0	0.0	N		0.0	09 12		5.0	0.6 0.8
290500 AIRCRAFT BLEED AIR SUBSYSTEM																					
290501 BLEED AIR VALVE	67020	67W20	67020	13	070 67		111 17		537 17		35	0.0	0.0	0.0	N		0.0	08 09		0.8	1.4 1.5
290502 LINE/HOSE	67020	67W20	67020	5	127 33		106 17		135 17		23	0.0	0.0	0.0	Y	09	0.05	09		0.3	1.9 2.5
290600 ENG ANTI-ICE/DE-ICE SUBSYSTEM																					

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH MFTH 3/4	SCH MIN	REP EMT/ HRS
290601 67020 67W20 68F20 TEMPERATURE SENSOR	11	242 33		374 33		730 33		53	0.0	0.0	0.0	N		0.0	09 23		10.0	2.4 5.4
290602 67020 67W20 68F20 ENGINE ANTI-ICE SWITCH	4	242 60		374 40		0		29	0.0	0.0	0.0	N		0.0	08		1.3	0.7 1.2
290603 67020 67W20 68F20 SOLENOID VALVE	10	070 33		111 33		537 33		46	0.0	0.0	0.0	N		0.0	08		0.8	1.8 1.9
290604 67020 67W20 68F20 WIRING HARNESS	2	070 100		0		0		15	0.0	0.0	0.0	N		0.0	09 09		1.5	0.5 0.5
290700 START SUBSYSTEM																		
290701 67020 67W20 68F20 STARTER SWITCH	12	381 31		242 15		374 15		29	22.8	48.[illegible]	[illegible].0	N		0.0	08		0.8	1.3 2.5
290702 67020 67W20 68F20 STARTER RELAY	3	070 33		450 33		615 33		0	0.0	0.0	0.0	N		0.0	08		0.8	1.2 2.3
290703 67020 67W20 68F20 STARTER SOLENOID	40	106 20		374 20		105 20		0	0.0	0.0	0.0	N		0.0	08		0.8	1.5 2.2
290704 67020 67W20 68F20 STARTER GENERATOR	123	374 34		070 11		730 11		4	13.5	21.7	19.9	N		0.0	08 09		2.0	2.2 3.2
290705 67020 57W20 68H20 HYDRAULIC STARTER	297	381 42		037 18		374 45		29	17.7	40.8	6.7	Y	09	0.10	08 09		3.0	1.3 1.8
290706 67020 67W20 68H20 STARTER PRESSURE SWITCH	32	374 14		070 11		242 11		15	30.3	37.1	10.1	N		0.0	08		0.8	1.3 1.8
290707 67020 67W20 69H20 ENG START HYD MANIFOLD VALVE	36	381 46		242 14		374 11		17	13.8	34.6	0.0	Y	09	0.07	09 09		1.0	1.4 1.8
290800 THROTTLE/POWER LEVER SUBSYSTEM																		
290801 67020 67W20 67020 CONTROL QUADRANT ASSY	144	374 22		242 14		127 9		9	12.3	16.7	26.5	Y	08 09	0.20	08 09		3.0	0.9 1.2
290802 67020 67W20 67020 ENGINE CONDITION CONTROL BOX	57	374 36		242 15		901 9		10	9.7	14.0	39.8	N		0.0	08		2.0	1.1 1.5
290803 67020 67W20 67020 THROTTLE TWIST GRIP MECHANISM	5	127 33		135 33		437 33		5	0.0	0.0	0.0	Y	08 09	0.20	08 09		1.5	3.5 4.3
290804 67020 67W20 67020 ENGINE CONTROL LINKAGE	3	020 36		710 22		730 12		70	0.0	0.0	0.0	Y	09	0.10	08 09		0.5	1.1 1.1

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
290805	67020	67W20	67020	11	135		127		780		30	7.6	9.4	0.0	Y	09	0.10	08	13	3.0	2.4
CABLE/PULLEY					24		21		11									09			5.0
290806	67020	67W20	67020	1	730						0	0.0	0.0	0.0	N		0.0	08		3.0	1.2
CONTROL CABLE TENSIONER					100		0		0									09			1.2
290807	67020	67W20	67020	194	020		410		127		19	6.8	11.7	66.7	Y	09	0.10	08		1.5	1.2
FLEX CABLE					41		21		8									09			1.7
290808	67020	67W20	67020	1	020						138	0.0	0.0	0.0	N		0.0	09		0.5	0.5
BOOT/SEAL					100		0		0												0.5
290809	67020	67W20	68B20	217	127		020		585		9	8.0	13.2	19.8	N		0.0	08		2.0	1.4
DROOP COMPENSATOR CAM BOX					40		32		6									09			1.7
290810	67020	67W20	68F20	2	127						0	0.0	0.0	0.0	N		0.0	08		1.3	1.2
TRIM SWITCH					100		0		0									09			1.7
290811	67020	67W20	68F20	459	127		242		135		20	3.5	4.6	50.0	N		0.0	08		1.0	0.9
RPM CONTROL ACTUATOR					31		17		8									09			1.2
290812	67020	67W20	68F20	5	615		719		730		15	20.0	60.0	99.9	N		0.0	08		1.5	2.0
ELECTRICAL HARNESS ASSY					60		20		20									09			3.0
290900																					
RPM WARNING SUBSYSTEM																					
290901	67020	67W20	68F20	120	374		127		615		2	15.7	17.0	0.0	N		0.0	08		0.8	1.9
ENGINE SPEED SENSITIVE SWITCH					29		23		15												3.1
290902	67020	67W20	68F20	861	127		374		901		2	2.7	2.9	42.4	N		0.0	08		3.0	1.1
RPM WARNING LIMIT DETECTOR/BOX					32		31		17									09			1.7
290903	67020	67W20	68F20	130	242		105		106		5	1.5	1.7	30.0	N		0.0	08		1.5	1.1
AUDIO WARNING UNIT					40		10		10									09			1.7
291000																					
AIRCRAFT LUBRICATION SUBSYSTEM																					
291001	67020	67W20	67020	5	381						20	0.0	0.0	0.0	Y	09	0.20	09		3.0	1.5
OIL TANK					100		0		0												1.5
291002	67020	67W20	67020	29	105		780		070		53	0.0	0.0	0.0	Y	09	0.10	09		2.0	1.7
OIL COOLER BLOWER					17		17		13									10			2.4
291003	67020	67W20	68G20	3	190						139	0.0	0.0	0.0	N		0.0	09		1.0	0.5
BLOWER DUCT					100		0		0												0.5
291004	67020	67W20	67020	52	070		020		190		26	0.0	0.0	0.0	Y	09	0.10	09		1.5	2.2
OIL COOLER					19		13		13												2.5

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TDS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
291005 67020 67W20 67020 THERMOSTATIC BYPASS VALVE	2	135 100		0		0		0	0.0	0.0	0.0	N		0.0	09		0.5	0.6 1.8
291006 67020 67W20 68F20 SOLENOID SHUT-OFF VALVE	5	242 33		374 33		730 33		0	0.0	0.0	0.0	N		0.0	09		0.8	1.2 1.2
291007 67020 67W20 67020 LINE/HOSE	6	381 26		020 23		127 13		28	9.2	26.8	[illegible].0	Y	09	0.05	09		0.3	1.0 1.8
410000 AIR COND/SURFCE ICE CONTRL SYS																		
410100 WINDSHIELD ANTI-ICE SUBSYSTEM																		
410101 67020 67W20 68F20 THERMOSTAT	7	730 100		0		0		0	0.0	0.0	0.0	N		0.0	08		0.8	0.5 0.5
410102 67020 67W20 68F20 ANTI-ICE SWITCH	4	242 60		374 40		0		29	0.0	0.0	0.0	N		0.0	09		1.3	0.7 1.2
410103 67020 67W20 68F20 HEAT RELAY	3	070 33		450 33		615 33		0	0.0	0.0	0.0	N		0.0	08		0.8	1.5 2.2
410104 67020 67W20 68F20 HEATER ELEMENT	4	615 100		0		0		0	0.0	0.0	0.0	N		0.0	07 08		5.0	1.0 1.0
420000 ELECTRICAL SYSTEM																		
420100 AC POWER SUBSYSTEM																		
420101 67020 67W20 68F20 GENERATOR	22	374 20		585 20		070 12		7	0.0	0.0	0.0	N		0.0	09		8.0	1.9 3.1
420102 67020 67W20 68F20 VOLTAGE REGULATOR	7	374 38		127 13		160 13		22	14.2	33.3	0.0	N		0.0	08 09		1.0	0.8 0.9
420103 67020 67W20 68F20 RELAY	3	070 100		0		0		0	0.0	0.0	0.0	N		0.0	08 09		0.8	1.5 2.3
420104 67020 67W20 68F20 CURRENT LIMITER	1	070 50		472 50		0		0	0.0	0.0	0.0	N		0.0	08 09		0.1	0.4 2.4
420105 67020 67W20 68F20 RECEPTACLE	4	190 40		070 20		105 20		55	0.0	0.0	0.0	N		0.0	08 09		1.0	1.4 1.4
420106 67020 67W20 68F20 TRANSFORMER	23	381 29		106 14		450 14		0	14.3	33.4	99.9	N		0.0	08 09		1.0	1.0 1.2

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
420107 67020 67W20 68F20 TRANSFORMER RECTIFIER	9	070 40		450 40		108 20		32	0.0	0.0	0.0	N		0.0	08 09		1.0	0.8 1.0
420108 67020 67W20 68F20 INVERTER	116	190 35		374 20		169 15		12	7.4	11.2	39.8	N		0.0	08 09		1.5	1.1 1.6
420109 67020 67W20 68F20 CONTROL SWITCH	64	374 26		958 13		901 10		18	16.3	19.5	44.9	N		0.0	08		1.3	1.4 2.4
420200 DC POWER SUPPLY SUBSYSTEM																		
420201 67020 67W20 68F20 GENERATOR	141	374 28		070 19		169 9		13	20.5	26.7	12.4	N		0.0	09		8.0	1.9 3.7
420202 67020 67W20 68F20 VOLTAGE REGULATOR	84	127 35		169 21		374 17		3	6.0	6.6	0.0	N		0.0	08 09		1.0	0.6 0.9
420203 67020 67W20 68F20 RELAY	34	450 23		374 22		070 13		32	10.4	11.3	0.0	N		0.0	08 09		0.8	0.9 1.0
420204 67020 67W20 68F20 CURRENT LIMITER	1	070 50		472 50		 0		0	0.0	0.0	0.0	N		0.0	08 09		0.1	0.4 2.4
420205 67020 67W20 68F20 RECEPTACLE	46	070 50		190 50		 0		70	0.0	0.0	0.0	N		0.0	08 09		1.0	2.4 4.5
420206 67020 67W20 68F20 BATTERY	.1634	169 48		374 17		962 4		28	3.1	6.0	0.0	Y	09	0.10	08 09		15.0	0.7 0.8
420207 67020 67W20 68F20 BATTERY SUMP JAR	163	230 60		170 9		190 7		90	1.2	2.3	0.0	Y	09	0.10	09		10.0	1.2 1.4
420300 ELECT PWR DISTRIBUTION SUBSYS																		
420301 67020 67W20 68F20 MASTER SWITCH CONTROL PANEL	3	127 100		 0		 0		0	0.0	0.0	0.0	N		0.0	08 09		1.3	0.3 0.3
420302 67020 67W20 68F20 AIRCRAFT WIRING	266	070 18		730 13		020 8		8	1.5	3.0	0.0	N		0.0	08 09		36.0	1.5 1.9
440000 LIGHTING SYSTEM																		
440100 INTERIOR LIGHTS SUBSYSTEM																		
440101 67020 67W20 68F20 COCKPIT/CABIN LIGHT	61	080 40		070 14		730 10		9	0.0	0.0	0.0	1	04	0.10	08 09		0.3	0.6 0.8

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
440102 INSTRUMENT LIGHT	67020	67M20	68F20	58	080 61		106 11		160 6		8	0.0	0.0	0.0	Y	04	0.03	08 09		0.1	0.6 0.8
440103 CONTROL PANEL	67020	67M20	68F20	529	374 21		958 14		080 7		13	0.8	0.9	0.0	Y	04	0.10	08 09		1.0	0.9 1.3
440200 EXTERIOR LIGHTS SUBSYSTEM																					
440201 LANDING LIGHT	67020	67M20	68F20	321	080 35		374 18		135 13		16	0.0	0.0	0.0	Y	04	0.10	08 09		1.0	0.7 0.8
440202 SEARCH LIGHT	67020	67M20	68F20	361	374 28		080 21		958 9		21	0.0	0.0	0.0	Y	04	0.20	08 09		2.0	0.8 0.9
440203 POSITION/FORMATION LIGHT	67020	67M20	68F20	41	080 59		070 10		106 6		12	3.4	4.7	10.5	Y	04	0.10	08 09		0.3	0.6 0.7
440204 ANTI-COLLISION LIGHT	67020	67M20	68F20	501	080 49		374 13		070 9		6	1.1	1.6	30.5	Y	04	0.10	08 09		1.5	0.9 1.1
440205 FLASHER UNIT	67020	67M20	68F20	32	374 50		450 20		160 10		14	0.0	0.0	0.0	N		0.0	08		0.5	0.8 1.3
440206 CONTROL PANEL	67020	67M20	68F20	6	093 50		730 50		0		0	0.0	0.0	0.0	Y	04	0.10	08 09		0.5	0.7 0.7
450000 HYDRAULIC POWER SYSTEM																					
450100 HYDRAULIC SOURCE/DISTRI SUBSYS																					
450101 RESERVOIR	67020	67M20	68H20	205	381 53		230 21		410 8		35	21.7	37.2	0.0	Y	09	0.10	03 09		3.0	0.8 1.1
450102 HYDRAULIC PUMP	67020	67M20	68H20	170	381 40		374 14		020 8		8	6.1	8.8	66.7	Y	09	0.10	09		4.0	1.1 1.5
450103 HYDRAULIC HAND PUMP	67020	67M20	68H20	320	070 60		020 10		381 10		17	2.0	8.7	0.0	Y	09	0.10	09		2.5	1.1 1.5
450104 HYDRAULIC FILTER	67020	67M20	67020	251	306 45		230 44		381 4		51	0.0	0.0	0.0	Y	01 09	0.10	04 08	09 12	10.0	0.9 1.4
450105 ACCUMULATOR	67020	67M20	68H20	158	381 59		525 14		651 5		15	2.5	8.1	12.2	Y	09	0.10	08 09		3.0	2.0 2.8
450106 SOLENOID VALVE	67020	67M20	68F20	3	381 100		0		0		0	0.0	0.0	0.0	N		0.0	08 09		0.8	1.0 1.8

WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
450107	67020	67W20	68H20	5	381		106		374		0	27.1	31.6	0.0	N		0.0	08		0.5	0.8
RELIEF VALVE					47		13		13												0.8
450108	67020	67W20	68H20	4	381		020				13	0.0	0.0	0.0	N		0.0	08		0.5	1.2
CHECK VALVE					90		10		0												2.2
450109	67020	67W20	68H20	7	106		190				160	0.0	0.0	0.0	N		0.0	09		0.5	0.8
DRAIN VALVE					50		50		0												0.8
450110	67020	67W20	68H20	24	381		585		070		7	0.0	0.0	0.0	N		0.0	08		2.5	1.2
HYDRAULIC MOTOR					26		22		15									09			1.4
450111	67020	67W20	68F20	142	615		242		020		16	13.4	20.5	0.0	N		0.0	08		1.3	1.1
SWITCH					18		11		9												1.6
450112	67020	67W20	68H20	1	381		020		780		35	3.8	8.0	32.4	Y	09	0.05	08		0.3	1.0
HOSE/LINE					64		21		6									09			1.2
450200																					
HYDRAULIC BOOST SUBSYSTEM																					
450201	67020	67W20	68H20	14	020		381		525		10	0.0	0.0	0.0	Y	09	0.10	08		3.0	0.9
ACCUMULATOR					25		25		25									09			1.4
450202	67020	67W20	68H20	15	381		070		127		52	15.6	65.8	50.0	Y	09	0.07	08		1.5	1.9
FLIGHT BOOST MANIFOLD					59		6		6									09			2.7
450203	67020	67W20	68H20	1	242		381				0	0.0	0.0	0.0	Y	09	0.10	08		2.0	1.7
CONTROL/PILOT VALVE					50		50		0									09			2.0
450204	67020	67W20	68H20	604	381		710		127		52	9.2	13.2	27.5	Y	09	0.10	08	12	18.5	1.8
CYLINDER					29		16		11									09	25		2.9
450206	67020	67W20	68H20	15	381		167		127		90	0.0	0.0	0.0	N		0.0	03		1.0	1.8
IRREVERSIBLE VALVE					43		36		14									09			2.6
450207	67020	67W20	68H20	47	135		381		020		45	0.0	0.0	0.0	N		0.0	08		2.0	1.5
LOCK-OUT VALVE					29		29		14									09			2.8
450208	67020	67W20	68H20	8	381		150		308		10	0.0	0.0	0.0	N		0.0	08		0.5	3.4
PRESSURE REDUCER VALVE					28		22		11												5.3
450300																					
HYD PRESSURE INDICATING SUBSYS																					
450301	67020	67W20	68F20	6	374		730		070		13	9.1	12.5	0.0	N		0.0	08		0.8	0.6
PRESSURE SWITCH					33		17		8									09			0.8
450400																					
HYDRAULIC COOLING SUBSYSTEM																					

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
450401 COOLER BLOWER	67020	67W20	67020	69	242 29		135 16		900 13		42	13.4	23.2	0.0	Y	09	0.10	05 09		4.0	1.4 1.7
450402 BLOWER DUCT	67020	67W20	68G20	2	780 100		0		0		0	0.0	0.0	0.0	N		0.0	09		1.0	4.0 4.0
450403 ELECTRO-HYDRAULIC MOTOR	67020	67W20	68H20	9	070 40		374 40		381 20		0	0.0	0.0	0.0	N		0.0	09		2.0	1.5 2.5
450404 HYD FLUID COOLER	67020	67W20	68H20	230	381 50		190 13		306 8		14	11.7	26.5	42.3	Y	09	0.10	09		1.5	1.7 2.2
450405 THERMOSTAT	67020	67W20	68F20	61	615 27		020 21		374 12		31	10.6	18.6	0.0	N		0.0	08		0.8	0.8 0.9
460000 FUEL SYSTEM																					
460100 FUEL SUPPLY/DISTRI SUBSYSTEM																					
460101 FUEL CEL'	67020	67W20	67020	17	374 14		731 11		190 9		28	1.9	2.7	47.0	N		0.0	05		30.0	3.9 7.5
460102 SUMP PUMP	67020	67W20	68F20	79	242 35		381 13		070 8		11	9.1	11.1	0.0	N		0.0	05		4.0	1.9 2.5
460103 FUEL FILTER	67020	67W20	67020	79	070 25		381 25		230 21		29	15.5	27.1	0.0	Y	01 09	0.10	04 09	12	10.0	0.8 0.8
460104 ENGINE FUEL PURIFIER	67020	67W20	67020	13	381 57		230 14		020 7		38	8.8	19.7	99.9	Y	09	0.10	09		10.0	1.0 1.3
460105 FUEL SELECTOR VALVE	67020	67W20	67020	5	242 67		450 33		0		0	0.0	0.0	0.0	N		0.0	08		1.3	1.6 2.9
460106 LINE/HOSE	67020	67W20	67020	3	020 38		381 32		780 6		24	5.9	11.4	0.0	Y	09	0.05	04 09		0.3	1.6 2.1
460108 PRESSURE FUELING ADAPTER	67020	67W20	67020	7	381 100		0		0		0	0.0	0.0	0.0	N		0.0	09 10		2.0	1.0 1.0
460109 DEFUELING VALVE	67020	67W20	67020	12	381 43		020 29		780 14		20	32.9	75.0	0.0	N		0.0	08 09		4.0	0.9 1.0
460110 SUMP DRAIN	67020	67W20	67020	9	381 73		020 9		106 9		13	10.0	25.0	0.0	Y	04	0.10	08 09		1.0	0.5 0.5
460200 AUX POWER PLANT FUEL SUBSYSTEM																					

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ERT/ HRS
460201 FUEL PUMP	67020	67W20	68F20	9	242 60		361 20		602 20		35	0.0	0.0	0.0	N		0.0	09		1.0	1.1 1.3
460202 SOLENOID VALVE	67020	67W20	68F20	3	381 100		0		0		0	0.0	0.0	0.0	N		0.0	09		0.8	1.0 1.8
460203 FUEL SHUTOFF VALVE	67020	67W20	67020	33	135 33		242 22		080 11		0	0.0	0.0	0.0	N		0.0	09		0.8	3.5 8.0
460204 LINE/HOSE	67020	67W20	67020	1	106 67		651 33		0		35	0.0	0.0	0.0	Y	09	0.05	09		0.3	1.2 2.3
490000 MISCELLANEOUS UTILITIES SYSTEM																					
490100 FIRE WARNING/DETECT SUBSYSTEM																					
490101 FIRF DETECTION ELEMENT	67020	67W20	68F20	4	242 40		374 20		450 20		21	15.3	22.1	0.0	Y	09	0.10	08 09		1.0	0.9 1.4
490102 AMPLIFIER	67020	67W20	68F20	4	242 50		374 25		615 25		0	25.0	50.0	0.0	N		0.0	08		0.8	0.9 1.6
490103 FIRE DETECTION CONTROL	67020	67W20	68F20	8	070 33		080 22		374 22		18	0.0	0.0	0.0	N		0.0	08		1.3	0.7 1.1
490104 FIRE DETECTION TEST SWITCH	67020	67W20	68F20	17	127 22		374 22		730 22		18	0.0	0.0	0.0	N		0.0	08		1.3	0.5 0.9
490200 FIRE EXTINGUISHING SYSTEM																					
490201 CONTROL SWITCH	67020	67W20	68F20	4	242 60		374 40		0		29	0.0	0.0	0.0	N		0.0	08 22		1.3	0.7 1.2
490202 WIRING HARNESS	67020	67W20	68F20	14	242 25		730 25		080 13		30	0.0	0.0	0.0	N		0.0	08 09	22	1.5	2.3 4.0
490203 NITROGEN FIRE BOTTLE	67020	67W20	67020	29	540 14		070 14		931 13		21	7.3	22.3	50.0	N		0.0	09		1.5	1.1 1.1
490204 LINE/HOSE	67020	67W20	67020	7	070 44		106 22		780 22		35	0.0	0.0	0.0	N		0.0	09		0.3	0.7 0.7
490300 WINDSHIELD WIPER SUBSYSTEM																					
490301 WIPER CONTROL PANEL	67020	67W20	68F20	15	070 25		093 25		105 25		0	0.0	0.0	0.0	N		0.0	08		1.3	0.4 0.4

WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
490302 WIPER MOTOR	67020	67W20	68F20	3	135 50		900 50		0		69	60.0	99.9	50.0	N		0.0	08 09		1.5	2.3 2.8
490303 RELAY	67020	67W20	68F20	3	070 100		0		0		0	0.0	0.0	0.0	N		0.0	08 09		0.8	1.5 2.3
490304 WIRING HARNESS	67020	67W20	68F20	7	070 50		127 50		0		15	0.0	0.0	0.0	N		0.0	08 09		1.5	0.5 0.5
490305 MECHANICAL LINKAGE	67020	67W20	67020	5	070 54		106 25		127 11		35	0.0	0.0	0.0	N		0.0	08 09		0.5	1.0 1.0
490306 BLADE ARM	67020	67W20	67020	12	127 29		070 14		135 14		79	0.0	0.0	0.0	N		0.0	09		0.8	1.1 1.3
490307 BLADE	67020	67W20	67020	2	020 100		0		0		138	0.0	0.0	0.0	N		0.0	09		0.8	1.0 1.0
490400 BLEED AIR RAIN REMOVAL SUBSYS																					
490401 HEAT/RAIN REMOVAL VALVE	67020	67W20	67020	7	242 100		0		0		0	0.0	0.0	0.0	N		0.0	09		1.5	4.3 6.5
490402 LINE/HOSE	67020	67W20	67020	5	127 33		106 17		135 17		23	0.0	0.0	0.0	N		0.0	09		0.3	1.9 2.5
490500 WINDSHIELD WASHER SUBSYSTEM																					
490501 WASHER SWITCH	67020	67W20	68F20	4	242 60		374 40		0		29	0.0	0.0	0.0	N		0.0	08		1.3	0.7 1.2
490502 ELECTRIC PUMP	67020	67W20	68F20	7	108 50		127 50		0		0	0.0	0.0	0.0	N		0.0	08 09		1.5	0.3 0.3
490503 RESERVOIR	67020	67W20	67020	7	651 50		958 50		0		29	0.0	0.0	0.0	N		0.0	08 09		3.0	0.5 0.5
490504 WASHER NOZZLES	67020	67W20	67020	60	230 33		127 33		730 10		50	0.0	0.0	0.0	N		0.0	08 09		0.8	0.9 0.9
490600 CARGO SUSPENSION SUBSYSTEM																					
490601 CARGO SUSPENSION ASSEMBLY	67020	67W20	67020	10	170 33		127 22		190 17		54	0.0	0.0	0.0	Y	09 10	0.30	08 09		10.0	1.2 1.2
490602 CARGO HOOK ASSEMBLY	67020	67W20	67020	30	127 22		070 14		374 14		0	0.0	0.0	0.0	Y	09 10	0.20	08 09	10 11	8.0	1.3 1.8

WUC MOS 1 MOS 2 MOS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
490603 67020 67W20 67020	34	070		127		020		42	3.1	4.1	0.0	N		0.0	08		4.0	1.6
CARGO RELEASE PEDAL/CABLE		42		15		9									09			1.6
490604 67020 67W20 68F20	89	242		135		374		13	22.7	45.4	40.0	N		0.0	08		0.8	2.0
RELEASE SOLENOID		67		17		8									09			3.7
490605 67020 67W20 68F20	6	615		160		374		0	0.0	0.0	0.0	N		0.0	08		0.8	1.2
RELEASE RELAY		33		33		33									09			1.8
490606 57020 67W20 68F20	7	070		029		037		0	12.5	25.0	0.0	N		0.0	08		2.5	1.0
WINCH CONTROL PANEL		25		13		13												1.3
490607 6702C 67W20 68H20	346	381		020		070		4	0.8	1.4	99.9	Y	09	0.20	09		8.0	1.1
HYDRAULIC WINCH ASSEMBLY		43		11		5									11			1.6
490608 67020 67W20 68H20	45	381		780		020		40	5.1	9.0	5.0	Y	09	0.10	08		8.0	1.9
LOAD LEVELER CYLINDER		86		8		2									09			3.2
490609 67020 67W20 68H20	280	381		242		374		11	16.0	45.9	0.0	Y	09	0.10	08		3.0	2.9
WINCH PUMP		60		11		7									09			6.7
490610 67020 67W20 68H20	45	242		135		374		13	22.7	45.4	40.0	N		0.0	08		0.5	2.0
RELIEF/SHUTOFF VALVE		67		17		8												3.7
490611 67020 67W20 67020	41	381		020		070		22	8.1	16.7	0.0	Y	09	0.05	08		0.3	1.4
LINE/HOSE		79		5		5									09			2.1
490612 67020 67W20 67020	16	070		020		719		35	0.0	0.0	0.0	N		0.0	08		15.0	1.1
HOIST CABLE		44		22		22									09			1.8
490613 67020 67W20 68F20	4	242		374				29	0.0	0.0	0.0	N		0.0	08		0.8	0.7
LIMIT SWITCH		60		40		0												1.2
490614 67020 67W20 68F20	9	106		080		127		0	0.0	0.0	0.0	N		0.0	08		1.3	0.6
CONTROL PANEL		33		25		25												0.8
490615 67020 67W20 67020	7	127		730				0	0.0	0.0	0.0	N		0.0	09	12	3.0	1.2
GUILLOTINE		75		25		0									10			1.2
490700																		
COMBUSTION HEAT/DEFOG SUBSYS																		
490701 67020 67W20 67020	43	070		190		242		29	20.9	20.9	0.0	N		0.0	09		5.0	1.5
COMBUSTION HEATER ASSEMBLY		22		11		11												2.7
490702 67020 67W20 68F20	96	374		615		900		19	2.3	2.7	99.9	N		0.0	09		3.0	1.7
AIR BLOWER		17		12		10												3.1
490703 67020 67W20 69G20	3	106		190		135		63	0.0	0.0	0.0	N		0.0	09		0.5	1.0
VENTILATION/HEATER DUCT		20		20		10												1.4

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
490704 AIR PRESSURE SWITCH	67020	67W20	68F20	41	070 46		374 27		108 9		29	0.0	0.0	0.0	N		0.0	09		0.8	2.0 2.6
490705 CABIN HEAT CONTROL PANEL	67020	67W20	68F20	6	730 100		 0		 0		0	0.0	0.0	0.0	N		0.0	09		1.3	0.8 1.3
490706 HEATER FUEL LINE	67020	67W20	67020	6	190 50		070 17		246 17		35	0.0	0.0	0.0	Y	09	0.05	09		0.3	0.7 0.7
490800 BLEED AIR HEAT/DEFOG SUBSYSTEM																					
490801 CONTROL PANEL	67020	67W20	68F20	9	730 33		070 33		105 33		0	0.0	0.0	0.0	N		0.0	08 09		3.0	1.5 1.8
490802 SOLENOID VALVE	67020	67W20	68F20	3	381 60		242 40		 0		0	0.0	0.0	0.0	N		0.0	08 09		0.8	1.0 1.8
490803 HEATER DUCT	67020	67W20	67020	1	190 83		947 10		730 7		87	0.0	0.0	0.0	N		0.0	08 09		0.3	0.9 1.2
490900 ELECTRIC CHIP DETECTOR SUBSYS																					
490901 CHIP DETECTOR RELAY PANEL	67020	67W20	69F20	52	615 36		450 21		374 14		34	17.9	22.0	50.0	N		0.0	08		0.8	1.5 2.1
490902 CHIP DETECTOR	67020	67W20	67020	18	070 34		230 11		381 6		19	10.1	13.6	13.0	N		0.0	08		5.0	0.8 1.0
491000 VISUAL AURAL DEBARK SUBSYSTEM																					
491001 CONTROL PANEL	67020	67W20	68F20	9	730 33		070 33		105 33		0	0.0	0.0	0.0	N		0.0	08		1.3	1.5 1.8
491002 WARNING HORN	67020	67W20	68F20	22	374 33		070 17		450 17		27	0.0	0.0	0.0	N		0.0	05 08		1.3	0.9 1.4
491003 FLASHER UNIT	67020	67W20	68F20	7	242 100		 0		 0		0	0.0	0.0	0.0	N		0.0	04 09		1.3	0.8 1.3
510000 INSTRUMENT SYSTEM																					
510100 FLIGHT INDICATORS SUBSYSTEM																					
510101 AIRSPEED	67020	57W20	67020	68	958 22		037 15		730 12		14	0.0	0.0	0.0	Y	09	0.10	09		0.5	0.8 1.4

MUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT AB: INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
510102 VERTICAL CLIMB	67020	67W20	67020	36	127 64		958 27		374 9		0	0.0	0.0	0.0	N		0.0	09		0.5	0.6 1.0
510103 BAROMETRIC ALTIMETER	67020	67W20	67020	162	127 61		958 19		374 7		4	1.1	1.1	99.9	N		0.0	09		0.5	0.6 0.9
510104 RATE OF CLIMB	67020	67W20	67020	29	127 44		958 22		135 11		0	0.0	0.0	0.0	N		0.0	09 26		4.0	0.7 1.5
510105 DIRECTIONAL GYRO	67020	35K20	35K20	12	374 57		958 29		730 14		0	0.0	0.0	0.0	N		0.0	09		0.5	0.6 0.7
510106 TURN/SLIP	67020	35K20	35K20	26	127 25		374 25		958 25		0	0.0	0.0	0.0	N		0.0	09 26		4.0	0.6 0.8
510107 ATTITUDE INDICATOR	67020	35K20	35K20	183	374 33		958 27		037 6		4	2.8	3.1	66.7	N		0.0	08 09	26	4.0	0.8 1.1
510108 FLT DIRECTOR HOVER INDICATOR	67020	67W20	67020	22	374 39		242 28		106 11		0	0.0	0.0	0.0	N		0.0	09		0.5	0.9 1.2
510109 CRUISE GUIDE INDICATOR	67020	35K20	35K20	24	127 33		374 33		958 12		0	0.0	0.0	0.0	N		0.0	09		0.5	0.7 1.0
510200 MISC FLIGHT INSTRUMENTS SUBSYS																					
510201 AC VOLTMETER	67020	67W20	68F20	26	127 50		070 13		106 13		0	0.0	0.0	0.0	N		0.0	08 09	22	9.0	0.6 0.9
510202 DC VOLTMETER	67020	67W20	68F20	48	127 27		374 27		958 20		9	0.0	0.0	0.0	N		0.0	09 22		9.0	0.7 0.8
510203 DC LOADMETER	67020	67W20	68F20	49	374 30		958 30		450 10		5	0.0	0.0	0.0	N		0.0	09		0.5	0.7 0.8
510204 CLOCK	67020	67W20	67020	203	374 31		958 11		070 10		9	0.0	0.0	0.0	N		0.0	08 09	26	2.0	0.6 0.8
510205 OUTSIDE AIR TEMPERATURE	67020	67W20	67020	39	374 33		334 17		958 17		0	0.0	0.0	0.0	N		0.0	09		0.5	0.5 0.6
510206 MASTER CAUTION LIGHT	67020	67W20	68F20	90	958 25		901 18		080 14		10	7.7	8.3	0.0	Y	08	0.10	08		0.2	1.0 1.4
510207 MASTER FIRE WARNING LIGHT	67020	67W20	68F20	35	730 27		070 18		127 18		0	0.0	0.0	0.0	Y	08	0.10	08		0.2	1.1 2.4
510208 CAUTION LIGHT	67020	67W20	68F20	13	127 16		080 13		07[illegible] [illegible]		4	4.5	5.2	15.6	Y	08	0.05	08		0.2	0.8 1.0

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC NOMENCLATURE	MDS 1	MDS 2	MDS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
510300 PITOT STATIC SUBSYSTEM																					
510301 PITOT HEAD	67020	67W20	67020	9	170 33		070 17		230 17		46	0.0	0.0	0.0	Y	07 09	0.30	07 09		4.0	1.1 1.2
510302 STATIC HEAD	67020	67W20	67020	5	070 33		135 33		230 33		0	0.0	0.0	0.0	Y	09	0.10	09		2.0	0.7 0.7
510303 PITOT HEAT SWITCH	67020	67W20	68F20	4	242 60		374 40		 0		29	0.0	0.0	0.0	Y	04	0.20	08		1.3	0.7 1.2
510304 LINE/HOSE	67020	67W20	67020	2	190 33		106 17		450 17		35	0.0	0.0	0.0	N		0.0	09		0.3	0.7 0.9
510305 DRAIN VALVE	67020	67W20	67020	9	3[illegible]1 73		020 9		106 9		13	0.0	0.0	0.0	N		0.0	09		3.0	1.0 1.8
510400 NAVIGATIONAL INDICATORS SUBSYS																					
510401 MAGNETIC COMPASS	67020	67W20	67020	119	080 28		374 22		127 14		27	0.0	0.0	0.0	N		0.0	08 09		0.5	0.8 1.0
510500 COMPASS SUBSYSTEM																					
510501 RADIO MAGNETIC INDICATOR	67020	35K20	35K20	40	374 22		958 22		080 11		6	0.0	0.0	0.0	N		0.0	08 09		0.5	0.8 0.9
510502 COMPASS TRANSMITTER	67020	35K20	35K20	23	374 29		070 14		127 14		0	0.0	0.0	0.0	N		0.0	08 09		0.8	1.3 1.5
510503 AMPLIFIER	67020	35K20	35K20	209	374 31		958 18		242 7		15	0.0	0.0	0.0	N		0.0	08 09		1.0	1.1 1.5
510504 DIRECTIONAL GYRO	67020	35K20	35K20	245	374 45		958 20		037 7		2	2.7	3.0	99.9	N		0.0	08 09		1.0	1.0 1.2
510505 CONTROLLER	67020	35K20	35K20	18	127 40		374 20		958 20		32	0.0	0.0	0.0	N		0.0	08		0.8	1.0 1.7
510600 ENGINE INSTRUMENTS SUBSYSTEM																					
510601 DUAL TACH INDICATOR	67020	67W20	68F20	95	374 38		958 14		381 14		24	4.2	4.3	0.0	Y	09	0.10	09		0.5	0.8 0.9
510602 TACH GENERATOR	67020	67W20	68F20	112	374 26		958 17		381 12		4	6.0	8.2	0.0	N		0.0	09		1.0	0.8 0.9

WUC MOS 1 MOS 2 MOS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
510603 67020 67W20 68F20 OIL TEMPERATURE INDICATOR	35	958 46		070 9		093 9		13	0.0	0.0	0.0	Y	09	0.10	09		0.5	0.7 0.7
510604 67020 67W20 68F20 OIL TEMPERATURE BULB	6	901 50		958 50		 0		0	0.0	0.0	0.0	N		0.0	09		0.8	0.5 0.5
510605 67020 67W20 68F20 OIL PRESSURE INDICATOR	81	374 24		135 16		127 12		11	4.4	5.3	0.0	Y	09	0.10	08 09		0.5	0.7 0.9
510606 67020 67W20 68F20 OIL PRESS TRANSMITTER	106	374 23		037 22		070 19		7	0.0	0.0	0.0	N		0.0	09		0.8	1.0 1.3
510607 67020 67W20 68F20 FUEL PRESSURE INDICATOR	59	374 28		037 17		730 17		23	0.0	0.0	0.0	Y	09	0.10	08 09		0.5	0.8 1.0
510608 67020 67W20 68F20 FUEL PRESSURE TRANSMITTER	229	374 35		958 13		070 9		6	1.5	2.0	0.0	N		0.0	09		0.8	1.2 1.4
510609 67020 67W20 68F20 TORQUE INDICATOR	123	092 26		958 21		374 16		7	2.8	3.1	0.0	Y	09	0.10	08 09		0.5	0.7 0.8
510610 67020 67W20 68F20 TORQUE SENSOR TRANSMITTER	16	127 39		037 17		374 17		10	0.0	0.0	0.0	N		0.0	09		0.8	1.5 2.1
510611 67020 67W20 68F20 EXHAUST GAS TEMP INDICATOR	164	127 44		958 24		037 8		11	2.2	3.1	0.0	Y	09	0.10	09 23		10.0	1.4 2.3
510612 67020 67W20 68F20 EXHAUST THERMOCOUPLE ASSY	16	070 20		108 20		127 20		28	0.0	0.0	0.0	N		0.0	09 23		10.0	2.1 2.3
510700 DRIVE SYS INSTRUMENTS SUBSYS																		
510701 67020 67W20 68F20 OIL PRESSURE INDICATOR	35	958 36		374 27		901 18		0	9.1	11.2	0.0	Y	09	0.10	08 09		0.5	1.0 1.2
510702 67020 67W20 68F20 OIL PRESSURE TRANSMITTER	39	381 17		958 17		037 8		23	10.0	11.1	0.0	N		0.0	09		0.8	0.8 0.9
510703 67020 67W20 68F20 OIL PRESSURE TRANSDUCER	22	070 35		374 15		615 6		9	0.0	0.0	0.0	N		0.0	09		0.8	0.9 1.0
510704 67020 67W20 68F20 TACH INDICATOR	65	958 30		127 30		374 20		0	10.0	10.6	50.0	Y	09	0.10	09		0.5	0.7 1.2
510705 67020 67W20 68F20 TACH GENERATOR	77	958 21		381 17		901 17		0	0.0	0.0	0.0	N		0.0	09		1.0	1.1 1.7
510706 67020 67W20 68F20 OIL TEMPERATURE INDICATOR	35	374 27		958 27		037 9		0	9.1	10.1	0.0	Y	09	0.10	09		0.5	0.7 1.3

INSPECTION ANALYSIS MASTER CONFIGURATION FILE

WUC MDS 1 MDS 2 MDS 3 NOMENCLATURE	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TOS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP ENT/ HRS
510707 67020 67W20 68F20 TEMP INDICATOR SELECT SW?TCH	37	070 14		135 14		730 14		0	0.0	0.0	0.0	N		0.0	09		1.3	0.9 1.4
510708 67020 67W20 68F20 OIL TEMPERATURE BULB	13	037 25		135 25		374 25		0	0.0	0.0	0.0	N		0.0	C9		0.8	0.6 0.7
510709 67020 67W20 68F20 THERMOSWITCH	10	070 33		169 33		242 33		0	0.0	0.0	0.0	N		0.0	09		0.8	2.6 4.6
510800 FUEL QUANTITY SUBSYSTEM																		
510801 67020 67W20 68F20 FUEL QUANTITY INDICATOR	161	958 26		127 26		374 24		31	0.0	0.0	0.0	Y	09	0.10	08 09		3.0	0.8 1.0
510802 67020 67W20 68F2C SELECTOR SWITCH	37	070 14		135 14		730 14		0	0.0	0.0	0.0	Y	04	0.10	08		1.3	0.9 1.4
510803 67020 67W20 68F20 FUEL QUANTITY TRANSMITTER	3	070 25		246 25		425 25		0	0.0	0.0	0.0	N		0.0	08		0.5	1.6 2.9
510804 67020 67W20 68F20 LOW LEVEL SWITCH	16	374 40		070 20		127 20		28	0.0	0.0	0.0	N		0.0	08		0.8	1.9 2.5
510900 HYDRAULIC INSTRUMENTS SUBSYS																		
510901 67020 67W20 68F20 BOOST PRESSURE INDICATOR	19	080 32		374 9		525 9		0	0.0	0.0	0.0	Y	09	0.10	08 09		0.5	0.6 0.7
510902 67020 67W20 68F20 UTILITY PRESSURE INDICATOR	200	525 32		037 14		135 8		27	11.1	20.1	30.1	Y	09	0.10	08 09		0.5	1.1 1.3
510903 67020 67W20 68F20 PRESSURE TRNSMITTER	242	374 21		381 13		950 13		0	8.0	9.9	50.0	N		0.0	08 09		0.8	0.7 0.9
511100 APP INSTRUMENTATION SUBSYSTEM																		
511101 67020 67W20 68F20 EGT INDICATOR	5	127 33		242 33		450 33		0	0.0	0.0	0.0	Y	09	0.10	09		0.5	2.3 3.6
511102 67020 67W20 68F20 TACHOMETER	11	037 33		255 33		135 17		0	0.0	0.0	0.0	Y	09	0.10	09		0.5	2.2 3.3
511103 67020 67W20 68F20 OIL PRESSURE INDICATOR	56	374 19		070 13		242 13		11	3.4	3.7	0.0	Y	09	0.10	09		0.5	0.7 0.9
910000 EMERGENCY EQUIP SYSTEM																		

WUC NOMENCLATURE	MOS 1	MOS 2	MOS 3	DET START RATE	1ST MODE/ PCNT	FR/ SCH DET	2ND MODE/ PCNT	FR/ SCH DET	3RD MODE/ PCNT	FR/ SCH DET	TDS HRS	ABT PRB/ W/FR	ABT PRB/ NO FR	PCNT ABT INFLT	FR INSP Y/N	FR METH 1/2	FR MIN	SCH METH 1/2	SCH METH 3/4	SCH MIN	REP EMT/ HRS
910100																					
FIRE FIGHTING EQUIP SUBSYSTEM																					
910101	67020	67W20	67020	19	093		070		246		69	0.0	0.0	0.0	Y	09	0.10	09		1.5	0.5
PORTABLE FIRE BOTTLE					33		17		17												0.5
910102	67020	67W20	67020	15	070		780		931		40	0.0	0.0	0.0	Y	09	0.10	09		1.5	0.5
FIRE/CRASH AXE/KNIFE					50		25		25												0.5
910200																					
MEDICAL EQUIP SUBSYSTEM																					
910201	67020	67W20	67020	1	106						0	0.0	0.0	0.0	Y	09	0.10	09		1.5	0.7
FIRST AID KIT					100		0		0												0.7
910300																					
SURVIVAL EQUIP SUBSYSTEM																					
910301	67020	67W20	67020	1	086						177	0.0	0.0	0.0	Y	09	0.10	09		1.5	0.5
SURVIVAL KIT					100		0		0												0.5

CONFIGURATION FILE CODE LISTINGS

Failure Mode Codes Numerical Listing

CODE	DESCRIPTION
001	Gassy
003	Open Filament or Tube Circuit
004	Low GM or Emission
007	Arcing, Arced
008	Noisy
009	Microphonic
010	Poor or Incorrect Focus
020	Worn, Chafed or Frayed
028	Conductance Incorrect
029	Current Incorrect
037	Fluctuates, Unstable or Erratic
051	Fails to Tune or Drifts
064	Incorrect Modulation
065	High Voltage Standing Wave Ratio
069	Flame-Out
070	Broken
080	Burned Out or Defective Light Bulb
086	Improper Handling
088	Incorrect Gain
092	Mismatched - Wheel Halves, Electronic Parts, etc.
093	Missing Part
094	No Gain or Emission
103	Attack Display Malfunction
105	Loose or Damaged Bolts, Nuts, Screws, Rivets, Fasteners, Clamps or other Common Hardware
106	Missing Bolts, Nuts Screws, Rivets, Fasteners, Clamps or Other Common Hardware
108	Broken, Faulty or Missing Safety Wire or Key
111	Burst or Ruptured
116	Cut
117	Deteriorated
127	Adjustment or Alignment Improper
130	Change of Value
135	Binding, Stuck or Jammed
142	Engine Removed, Excessive Maintenance
150	Chattering
158	Launch Damage
160	Contact/Connection Defective
167	Torque Incorrect
169	Incorrect Voltage
170	Corroded
177	Fuel Flow Incorrect
181	Compression Low
190	Cracked
230	Dirty
242	Failed to Operate or Function - Specific Reason Unknown
246	Improper or Faulty Maintenance
253	Misfires
255	No Output
277	Fuel Nozzle Coking
279	Spray Pattern Defective
290	Fails Diagnostic Automatic Test

CONFIGURATION FILE CODE LISTINGS - Continued

Failure Mode Codes Numerical Listing (Continued)

CODE	DESCRIPTION
301	Foreign Object Damage
303	Bird Strike Damage
306	Contamination
314	Slow Acceleration
315	RPM Fluctuation or Incorrect
317	Hot Start
330	Excessive Hum
334	Temperature Incorrect
350	Insulation Breakdown
372	Metal on Magnetic Plug
374	Internal Failure
380	Compressor or Turbine Wheel Damage - Reason Unknown
381	Leaking - Internal or External
382	Liquid Lock
383	Lock-on Malfunction
386	Maintenance Action Due to a Lost-in-Flight Occurrence
396	Oil Breathing Excessive
398	Oil Consumption Excessive
410	Lack of, or Improper Lubrication
424	External Power Source
425	Nicked
437	Improperly Positioned or Selected
447	Wrong Logic - Program or Computer
450	Open
457	Oscillating
458	Out of Balance
464	Overspeed
472	Fuse Blown or Defective Circuit Protector
481	Keyway or Spline Damaged or Worn
503	Sudden Stop
520	Pitted
525	Pressure Incorrect
537	Low Power or Thrust
540	Punctured
561	Unable to Adjust to Limits
567	Resistance Incorrect
583	Scope Presentation Incorrect or Faulty
585	Sheared
599	Travel or Extension Incorrect
601	Detonation
602	Failed, Damaged or Replaced Due to Malfunction of Associated Equipment or Item
603	Oil in Induction System
604	Manifold Pressure Beyond Limits
605	Crazed
606	Drone or Drone Compound Not Recovered
607	No-Go Indication - Specific Reason Unknown
608	Counter Run Off-Position Indicator
615	Shorted

CONFIGURATION FILE CODE LISTINGS - Continued

Failure Mode Codes Numerical Listing (Continued)

CODE	DESCRIPTION	CODE	DESCRIPTION
622	Wet	780	Bent, Buckled, Collapsed, Dented, Distorted or Twisted
649	Sweep Malfunction		
651	Air in System		
652	Automatic Align Time Excessive	781	Tire Leakage Excessive
653	Ground Speed Error Excessive	782	Tire Tread Area Defective - Use Cut, Delaminated, Punctured, Worn, etc.,if applicable
654	Terminal Error - CEP Excessive		
655	Terminal Error - Range Excessive	783	Tire Sidewall Damaged or Defective
656	Terminal Error - Azimuth Excessive	784	Tire Bead Area Damaged or Defective
660	Stripped	785	Tire Inside Surface Damaged or Defective
664	Tension Incorrect		
690	Vibration Excessive	786	Tire Blowout
692	Video Faulty	787	Tire Removed - Normal Wear
693	Audio Faulty		
694	Audio and Video Faulty	788	Tire Removed Due to Other Primary Cause, i.e., Brake or Wheel Failure, Hard Landing
695	Sync Absent or Incorrect		
697	Faulty Tape - Program or Checkout	799	No Defect
		800	No Defect - Component Removed and/or Reinstalled to Facilitate Other Maintenance
698	Faulty Card - Program or Checkout		
710	Bearing Failing or Faulty		
		801	No Defect - Removed for Modification
719	Broken or Frayed Bonding or Ground Wires	803	No Defect - Removed for Time Change
720	Brush Failure/Worn Excessively	804	No Defect - Removed for Scheduled Maintenance
730	Loose		
731	Battle Damage	806	No Defect - Removed as Part of a Matched System
748	Frequency Erratic or Incorrect		
758	Obsolete Surplus	816	Impedance Incorrect
770	Slip Ring or Commutator Failure	838	B Plus Incorrect
		846	Delaminated

CONFIGURATION FILE CODE LISTINGS - Continued

Failure Mode Codes Numerical Listing (Continued)

CODE	DESCRIPTION
877	Transportation Damage
878	Weather Damage
900	Burned or Overheated
901	Intermittent
910	Chipped
916	Impending or Incipient Failure Indicated by Spectrometric Oil Analysis
931	Accidental or Inadvertent Operation, Release or Activation
932	Does Not Engage Lock or Unlock Correctly
935	Scored or Scratched
937	Overheated Cathode Stem
938	Power Output Dip
947	Torn
955	Data Link High Error Rate
956	Abnormal Function of Computer Mechanical Equipment
957	No Display
958	Incorrect Display
959	Fails to Transfer to Redundant Equipment
961	High Anode Current
962	Low Power Electronic
963	Broken Filament/ Cathode Terminal
964	Poor Spectrum
966	RF Window Suck-in, Broken or Cracked
968	Dioding
969	Cannot Resonate Input Cavity
970	Coolant Leak
971	Cracked Cathode Bushing
972	Damaged Input Probe
973	Damaged Output Probe
974	Does Not Track Tuning Curve
975	Filament to Cathode Short
981	Frequency Instability
982	Frozen Tuning Mechanism
983	Grid to Cathode Short
984	Grid to Plate Short
985	High Body Current/ Beam Interruption
986	High Modulator Inverse
987	Input Pulse Distortion
988	Loss of Vacuum
989	Low Coolant Flow Rate
990	No Focus Current
991	Out-of-Band Frequency
992	Output Pulse Distortion
993	RF Drive Improper
994	RF Feed-Thru Attenuated/ Distorted
995	RF Feed-Thru Completely Interrupted
996	RF Terminal Overheated
997	RF Window Burned

CONFIGURATION FILE CODE LISTINGS - Continued

Inspection Methods Codes

1. BITE
2. BIM
3. Spectrographic Oil Analysis
4. Operational Visual Check
5. Operational Audio Check
6. Operational Vibratory Check
7. Operational Temperature Check
8. Functional Check
9. Static Visual Check
10. Manual Plan/Clearance Check
11. Precision Dimensional Check
12. Torque Check
13. Tension Check
14. Spring Rate Test
15. Vacuum Check
16. Pressure Test
17. Flow Rate Check
18. Optical Magnification Inspection
19. Dye Penetrant Inspection
20. Magnetic Particle Inspection
21. X-Ray Inspection
22. Elect/Avionic Check (Common Meters)
23. Elect/Avionic Check (Special Test Set)
24. Tap Test
25. Friction Check
26. Alignment Check
27. Time Check

APPENDIX IV
MAVIS MODEL DATA CHANGES

Nomenclature MCF No.	Det Start Rate	Tos (hr)	FR ([illegible])	Sch (min)	REP (hr)	EMT (hr)	Reasons
110108 Horizontal Stabilizer Section	101		0.10	1.5			Wave washer eliminates FR manual check and inspection dial indicator check
110304 Removable Fairing/Cowling	541				1.5	2.0	New fasteners with better access will improve reliability and ease installation
110603 Tail Boom Attach Fitting		26		1.0			Torque stripe will eliminate torque check and improve detectability
120101 Instrument Panel	80	14		1.0			Hinges decrease panel reliability, aid in instrument fault detectability
130103 Cross Tube				1.0			Time making precision measurements will be saved
130204 Shimmy Damper Assembly		50		5.0	0.4	0.5	Better access will improve detectability and ease inspection repair problems
130207 Wheel & Tire Assembly	313			0.5			New technique for wheel bearing inspection will improve reliability and simplify inspection
140104 Push-Pull Rods	21			0.5			New inspection method will improve reliability and decrease inspection time
140105 Crank/Lever/Arm	28			0.7			New inspection method will improve reliability and decrease inspection time
140205 Push-Pull Rods	6			0.5			New inspection method will improve reliability and decrease inspection time
140206 Crank/Lever/Arm	76			0.1			New inspection method will improve reliability and decrease inspection time
140301 Controls Mixer Assembly			0.53	17.6	1.7	2.0	Improved access will aid inspection and repair

NOTE: Blank column indicates no data change.

Nomenclature MCF No.	Det Start Rate	Tos (hr)	FR (min)	Sch (min)	REP (hr)	EMT (hr)	Reasons
140504 Push-Pull Rod				0.5			New inspection method will simplify process
140505 Crank/Lever/ Arm	17			0.7			New inspection method will improve reliability and decrease inspection time
140510 Cable Assy/ Turnbuckle	38			5.5			New cables will be more reliable and will allow deletion of hand check
140512 Chain Assy				1.5			New method, chain not removed
140803 SAS Control Actuator				2.4	2.0	3.8	Improved access will aid inspection and repair
220101 Engine Assembly	340			191			New borescope/fiber optic inspection method for compressor blades will become more reliable through a reduction in FOD
220302 Fuel Control Strainer				7.0	0.8	0.8	Safetying simplified
220303 Servo Filter				7.0	0.6	0.7	Safetying simplified
260101 Engine Drive Shaft	292	122					Pop-out temp sensor can be used to find failures (now found during daily inspection); eliminates teardown maintenance-induced failures
260103 Shaft Coupling Zurn Type	42	114					Pop-out temp sensor can be used to find failures (now found during daily inspection); eliminates teardown maintenance-induced failures
260801 Pylon Mount Assy				10.0	1.6	2.3	Access improved
290101 Engine Mount				1.9	1.5	2.3	Accessibility improvement on hard-to-get-to mounts

Nomenclature MCF No.	Det Start Rate	T_{os} (hr)	FR (min)	Sch (min)	REP (hr)	EMT (hr)	Reasons
290201 Particle Separator Assy	29	65			1.8	1.9	New design to cut down on crack damage but will take longer to repair (integral to engine)
290704 Starter Gen		50					Built-in wire checks brush wear
420201 Generator		50					Built-in wire checks brush wear
420206 Battery	1552			5.0			Battery capacity check deleted (checked in aircraft)
450401 Cooler Blower	46			3.0	1.1	1.3	Pull-out screen will improve reliability; access also improved
490902 Chip Detector	12			0.5	0.4	0.5	Ohmmeter will reduce thread strippage and simplify inspection
510101 Airspeed				0.3	0.5	0.9	Hinged instrument panel reduces inspection and repair times
510102 Vertical Climb				0.3	0.4	0.7	Hinged instrument panel reduces inspection and repair times
510103 Barometric Altimeter				0.3	0.4	0.6	Hinged instrument panel reduces inspection and repair times
510104 Rate of Climb				3.8	0.5	1.0	Hinged instrument panel reduces inspection and repair times
510105 Directional Gyro				0.3	0.4	0.5	Hinged instrument panel reduces inspection and repair times
510106 Turn/Slip				3.8	0.4	0.5	Hinged instrument panel reduces inspection and repair times
510107 Attitude Indicator				3.8	0.5	0.7	Hinged instrument panel reduces inspection and repair times
510109 Cruise Guide Indicator				0.3	0.5	0.7	Hinged instrument panel reduces inspection and repair times

Nomenclature MCF No.	Det Start Rate	T_{GS} (hr)	FR (min)	Sch (min)	REP (hr)	EMT (hr)	Reasons
510201 AC Voltmeter				8.8	0.4	0.6	Hinged instrument panel reduces inspection and repair times
510202 DC Voltmeter				8.8	0.5	0.5	Hinged instrument panel reduces inspection and repair times
510203 DC Loadmeter				0.3	0.5	0.5	Hinged instrument panel reduces inspection and repair times
510204 Clock				1.8	0.4	0.5	Hinged instrument panel reduces inspection and repair times
510206 Master Caution Light					0.7	0.9	Hinged instrument panel reduces inspection and repair times
510207 Master Fire Warning Light					0.7	1.6	Hinged instrument panel reduces inspection and repair times
510208 Caution Light					0.5	0.7	Hinged instrument panel reduces inspection and repair times
510304 Line/Hose				0.2	0.5	0.6	Hinged instrument panel reduces inspection and repair times
510601 Dual Tach Indicator				0.3	0.5	0.6	Hinged instrument panel reduces inspection and repair times
510603 Oil Temp Ind.				0.3	0.5	0.5	Hinged instrument panel reduces inspection and repair times
510607 Fuel Pressure Indicator				0.3	0.5	0.6	Hinged instrument panel reduces inspection and repair times
510609 Torque Ind.				0.3	0.5	0.5	Hinged instrument panel reduces inspection and repair times
510611 Exhaust Gas Temp Ind.				9.6	0.9	1.5	Hinged instrument panel reduces inspection and repair times
510701 Oil Pressure Indicator				0.3	0.7	0.8	Hinged instrument panel reduces inspection and repair times

Nomenclature MCF No.	Det Start Rate	T_{os} (hr)	FR (min)	Sch (min)	REP (hr)	EMT (hr)	Reasons
510704 Tach Indicator				0.3	0.5	0.8	Hinged instrument panel reduces inspection and repair times
510706 Oil Temperature Indicator				0.3	0.5	0.9	Hinged instrument panel reduces inspection and repair times
510801 Fuel Quantity Indicator				2.8	0.5	0.7	Hinged instrument panel reduces inspection and repair times
510901 Boost Pressure Indicator				0.3	0.4	0.5	Hinged instrument panel reduces inspection and repair times
510902 Utility Pressure Ind.				0.3	0.7	0.9	Hinged instrument panel reduces inspection and repair times
511101 EGT Indicator				0.3	1.5	2.4	Hinged instrument panel reduces inspection and repair times
511103 Oil Pressure Indicator				0.3	0.5	0.6	Hinged instrument panel reduces inspection and repair times

APPENDIX V

MAVIS "A" OPTION DATA BASE EXCERPT

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	QPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
1101080	HORIZONTAL STABILIZER SECTION	2	15	10	30	20	40	31	121	28	21	0	0	100.0
1103040	REMOVABLE FAIRING/COWLING	4	118	58	60	10	247	146	463	188	111	2	0	100.0
1106030	TAIL BOOM ATTACH FITTING	4	0	6	0	7	0	15	22	0	9	0	0	400.0
1201010	INSTRUMENT PANEL	1	0	6	0	1	0	6	7	0	5	0	0	800.0
1301030	CROSS TUBE	2	1	13	15	15	10	111	152	5	50	0	0	100.0
1401040	PUSH-PULL ROD	3	6	2	23	11	10	4	48	7	3	0	0	100.0
1401050	CRANK/LEVER/ARM, ETC	3	2	8	23	15	5	22	65	4	18	1	0	100.0
1402050	PUSH-PULL ROD	9	3	4	68	34	4	7	113	3	5	0	0	100.0
1402060	CRANK/LEVER/ARM, ETC	3	12	16	23	15	28	43	108	22	34	1	0	100.0
1403010	CONTROLS MIXER ASSEMBLY	1	4	*	45	50	10	*	105	8	0	0	0	100.0
1405040	PUSH-PULL ROD	8	0	1	60	30	1	4	95	1	2	0	0	100.0
1405050	CRANK/LEVER/ARM, ETC	10	12	9	70	50	22	20	169	17	15	0	0	100.0
1405100	CABLE ASSEMBLY/TURNBUCKLE	4	8	11	45	70	13	21	149	9	15	1	0	100.0
1405120	CHAIN ASSEMBLY	1	7	2	8	13	11	5	36	9	4	0	0	100.0

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	QPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
2201010	ENGINE ASSEMBLY	1	1	33	155	132	4	209	500	2	91	4	1	400.0
2203020	FUEL CONTROL STRAINER	1	0	1	0	3	0	1	4	0	1	0	0	800.0
2203030	SERVO FILTER	1	0	1	0	3	0	1	4	0	1	0	0	800.0
2601010	ENGINE DRIVE SHAFT	1	17	12	15	15	46	40	116	33	28	1	0	100.0
2601030	SHAFT COUPLING-ZURN TYPE	2	5	4	30	10	8	8	56	8	7	0	0	100.0
2602030	SHAFT COUPLING - ZURN TYPE	12	52	*	181	60	103	*	345	93	0	0	0	100.0
2608010	PYLON MOUNT ASSEMBLY	1	13	10	15	50	61	54	180	43	37	0	0	100.0
2901010	ENGINE MOUNT	3	11	8	16	15	27	22	80	18	15	1	0	100.0
2902010	PARTICLE SEPARATOR ASSY	1	10	2	23	20	15	3	61	14	3	0	0	100.0
2907040	STARTER GENERATOR	1	0	12	0	1	0	47	48	0	32	3	1	400.0
4202010	GENERATOR	1	2	12	0	20	7	54	80	3	28	3	0	100.0
4202060	BATTERY	1	31	86	8	38	25	82	152	22	72	3	0	100.0
4909020	CHIP DETECTOR	4	0	7	0	6	0	8	15	0	7	1	0	800.0

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	QPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR ENT	UNSCH REPR ENT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
5101010	AIRSPEED	2	2	12	15	2	3	19	40	2	11	0	0	100.0
5101020	VERTICAL CLIMB	2	0	7	0	0	0	9	9	0	5	0	0	800.0
5101030	BAROMETRIC ALTIMETER	2	0	32	0	1	0	34	35	0	23	0	0	400.0
5101040	RATE OF CLIMB	2	0	6	0	2	0	10	13	0	5	0	0	800.0
5101050	DIRECTIONAL GYRO	2	0	2	0	0	0	2	2	0	2	0	0	800.0
5101060	TURN/SLIP	2	0	5	0	2	0	5	7	0	4	0	0	900.0
5101070	ATTITUDE INDICATOR	2	0	36	0	5	0	47	53	0	35	1	1	400.0
5101090	CRUISE GUIDE INDICATOR	1	0	2	0	0	0	3	3	0	2	0	0	900.0
5102010	AC VOLTMETER	1	0	3	0	3	0	3	6	0	2	0	0	800.0
5102020	DC VOLTMETER	1	0	5	0	3	0	5	7	0	4	0	0	800.0
5102030	DC LOADMETER	2	0	10	0	0	0	9	10	0	8	0	0	800.0
5102040	CLOCK	1	0	19	0	1	0	19	20	0	14	0	0	.00.0
5102060	MASTER CAUTION LIGHT	1	1	8	0	0	1	13	15	1	10	1	0	100.0
5102070	MASTER FIRE WARNING LIGHT	1	0	3	0	0	0	10	10	0	5	0	0	800.0
5102080	CAUTION LIGHT	16	0	21	0	1	0	25	26	0	20	1	0	800.0
5103040	LINE/HOSE	15	0	3	0	1	0	3	5	0	2	0	0	800.0
5106010	DUAL TACH INDICATOR	1	2	7	8	1	2	8	18	2	7	0	0	100.0
5106030	OIL TEMPERATURE INDICATOR	1	0	3	8	1	0	3	12	0	3	0	0	100.0
5106050	OIL PRESSURE INDICATOR	1	1	7	8	1	1	8	17	1	6	0	0	100.0

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	QPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
5106070	FUEL PRESSURE INDICATOR	1	1	4	0	1	1	5	16	1	4	0	0	100.0
5106090	TORQUE INDICATOR	1	0	12	8	0	0	12	20	0	10	0	0	400.0
5106110	EXHAUST GAS TEMP INDICATOR	1	1	15	8	13	2	42	64	1	26	0	0	200.0
5107010	OIL PRESSURE INDICATOR	1	0	3	8	0	0	5	13	0	4	0	0	800.0
5107040	TACH INDICATOR	1	0	6	8	0	0	9	17	0	5	1	0	800.0
5107060	OIL TEMPERATURE INDICATOR	1	0	3	8	0	0	5	13	0	3	0	0	800.0
5108010	FUEL QUANTITY INDICATOR	1	5	11	8	7	5	13	33	4	10	0	0	100.0

APPENDIX VI
MAVIS "A" OPTION VALIDATION RUN EXCERPT

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	CPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
1101080	HORIZONTAL STABILIZER SECTION	2	12	8	15	7	31	23	77	21	16	0	0	100.0
			20	*	15	15	51	*	81	35	0	0	0	50.0
			6	13	15	4	15	41	76	11	29	0	0	200.0
1103040	REMOVABLE FAIRING/COWLING	4	115	56	60	10	230	125	426	173	101	1	0	100.0
			190	*	58	20	379	*	458	284	0	0	0	50.0
			56	107	61	5	112	258	437	84	193	3	0	200.0
1106030	TAIL BOOM ATTACH FITTING	4	0	6	0	2	1	14	17	1	9	0	0	400.0
			1	5	0	5	2	13	20	1	8	0	0	200.0
			0	6	0	1	0	15	16	0	9	0	0	800.0
1201010	INSTRUMENT PANEL	1	0	8	0	0	0	7	8	0	7	0	0	800.0
			0	8	0	1	0	7	8	0	6	0	0	400.0
			0	8	0	0	0	8	8	0	7	0	0	1600.0
1301030	CROSS TUBE	2	1	13	15	5	10	111	142	5	50	0	0	100.0
			3	11	15	10	21	99	144	9	44	0	0	50.0
			1	13	15	2	5	117	140	2	52	0	0	200.0
1401040	PUSH-PULL ROD	3	5	2	23	4	8	3	38	5	2	0	0	100.0
			6	*	22	7	11	*	40	8	0	0	0	50.0
			2	4	23	2	4	8	37	3	6	0	0	200.0
1401050	CRANK/LEVER/ARM, ETC	3	2	7	23	5	4	18	50	3	14	1	0	100.0
			4	5	22	10	8	13	54	7	10	1	0	50.0
			1	7	23	3	2	21	48	2	16	1	0	200.0
1402050	PUSH-PULL ROD	9	2	3	68	11	4	6	89	3	5	0	0	100.0
			5	1	66	22	7	2	97	5	1	0	0	50.0
			1	4	69	6	2	8	85	1	6	0	0	200.0
1402060	CRANK/LEVER/ARM, ETC	3	10	13	23	5	22	35	85	17	27	1	0	100.0
			20	3	22	10	45	8	85	35	6	0	0	50.0
			5	17	23	3	11	48	85	9	37	1	0	200.0

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	CPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
1403010	CONTROLS MIXER ASSEMBLY	1	4	*	40	44	9	*	93	7	0	0	0	100.0
			4	*	39	88	9	*	136	8	0	0	0	50.0
			3	2	41	22	6	4	72	5	3	0	0	200.0
1405040	PUSH-PULL ROD	8	0	1	60	10	1	4	75	1	2	0	0	100.0
			1	1	58	20	2	2	83	2	1	0	0	50.0
			0	1	61	5	1	4	71	0	3	0	0	200.0
1405050	CRANK/LEVER/ARM, ETC	10	10	7	76	17	18	17	128	13	12	0	0	100.0
			17	*	73	35	32	*	140	24	0	0	0	50.0
			5	12	77	9	9	29	122	7	20	0	0	200.0
1405100	CABLE ASSEMBLY/TURNBUCKLE	4	6	9	45	55	10	17	127	7	12	0	0	100.0
			13	2	44	110	20	5	175	14	3	0	0	50.0
			3	12	46	27	5	23	101	3	16	1	0	200.0
1405120	CHAIN ASSEMBLY	1	7	2	8	4	11	5	28	9	4	0	0	100.0
			9	*	7	7	16	*	31	12	0	0	0	50.0
			3	6	8	2	6	12	27	4	9	1	0	200.0
2201010	ENGINE ASSEMBLY	1	1	32	155	119	4	205	483	2	89	4	1	400.0
			1	32	154	239	8	201	601	3	87	4	1	200.0
			0	33	156	60	2	207	425	1	90	4	1	800.0
2203020	FUEL CONTROL STRAINER	1	0	1	0	2	0	1	3	0	1	0	0	800.0
			0	1	0	4	0	1	5	0	1	0	0	400.0
			0	1	0	1	0	1	2	0	1	0	0	1600.0
2203030	SERVO FILTER	1	0	1	0	2	0	1	3	0	1	0	0	800.0
			0	1	0	4	0	1	5	0	1	0	0	400.0
			0	1	0	1	0	1	2	0	1	0	0	1600.0
2601010	ENGINE DRIVE SHAFT	1	25	*	15	15	71	*	101	51	0	0	0	100.0
			27	*	15	30	76	*	121	54	0	0	0	50.0
			13	10	15	7	37	34	94	26	24	1	0	200.0
2601030	SHAFT COUPLING-ZURN TYPE	2	8	*	30	10	13	*	53	12	0	0	0	100.0
			8	*	29	20	13	*	63	12	0	0	0	50.0
			5	4	31	5	7	7	50	7	6	0	0	200.0

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	CPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
2602030	SHAFT COUPLING - ZURN TYPE	12	47	*	181	60	94	*	336	85	0	0	0	100.0
			48	*	175	120	95	*	351	86	0	0	0	50.0
			46	*	184	30	92	*	307	83	0	0	0	200.0
2608010	PYLON MOUNT ASSEMBLY	1	13	10	15	25	31	27	58	21	19	0	0	100.0
			24	*	15	50	55	*	120	38	0	0	0	50.0
			7	16	15	13	15	44	67	11	31	0	0	200.0
2901010	ENGINE MOUNT	3	11	8	16	14	26	21	77	17	14	1	0	100.0
			19	*	15	28	44	*	88	29	0	0	0	50.0
			6	13	16	7	13	37	73	8	24	1	0	200.0
2902010	PARTICLE SEPARATOR ASSY	1	2	1	23	20	4	2	49	3	2	0	0	100.0
			3	*	22	40	5	*	67	5	0	0	0	50.0
			1	2	23	10	2	4	39	2	4	0	0	200.0
2907040	STARTER GENERATOR	1	1	10	0	1	5	39	45	3	27	2	0	400.0
			3	9	0	2	9	34	45	6	23	2	0	200.0
			1	11	0	1	2	42	45	2	29	2	0	800.0
4202010	GENERATOR	1	7	7	0	20	24	30	75	13	16	2	0	100.0
			14	*	0	40	50	*	90	26	0	0	0	50.0
			3	10	0	10	12	44	67	6	23	3	0	200.0
4202060	BATTERY	1	30	82	8	13	24	79	123	21	69	3	0	100.0
			59	58	7	25	48	56	135	42	49	2	0	50.0
			15	95	8	6	12	92	118	11	80	3	0	200.0
4909020	CHIP DETECTOR	4	0	5	0	1	0	3	3	0	2	1	0	800.0
			0	5	0	1	0	3	4	0	2	1	0	400.0
			0	5	0	0	0	3	3	0	2	1	0	1600.0

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	CPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABCRT	IN-FLT ABCRT	INTVL BETW INSP
5101010	AIRSPEED	2	2	12	15	1	2	13	31	1	7	0	0	100.0
			4	10	15	3	3	10	32	2	6	0	0	50.0
			1	13	15	1	1	14	31	0	8	0	0	200.0
5101020	VERTICAL CLIMB	2	0	7	0	0	0	6	6	0	3	0	0	800.0
			0	7	0	0	0	6	6	0	3	0	0	400.0
			0	7	0	0	0	6	6	0	3	0	0	1600.0
5101030	BAROMETRIC ALTIMETER	2	0	32	0	0	0	23	24	0	15	0	0	400.0
			1	32	0	1	0	23	24	0	15	0	0	200.0
			0	32	0	0	0	23	23	0	15	0	0	800.0
5101040	RATE OF CLIMB	2	0	6	0	2	0	7	9	0	3	0	0	800.0
			0	6	0	5	0	7	12	0	3	0	0	400.0
			0	6	0	1	0	7	8	0	3	0	0	1600.0
5101050	DIRECTIONAL GYRO	2	0	2	0	0	0	1	2	0	1	0	0	800.0
			0	2	0	0	0	1	2	0	1	0	0	400.0
			0	2	0	0	0	1	2	0	1	0	0	1600.0
5101060	TURN/SLIP	2	0	5	0	2	0	3	5	0	2	0	0	800.0
			0	5	0	5	0	3	8	0	2	0	0	400.0
			0	5	0	1	0	3	4	0	2	0	0	1600.0
5101070	ATTITUDE INDICATOR	2	0	36	0	5	0	30	35	0	22	1	1	400.0
			1	36	0	9	1	30	40	0	21	1	1	200.0
			0	36	0	2	0	30	33	0	22	1	1	800.0
5101090	CRUISE GLIDE INDICATOR	1	0	2	0	0	0	2	2	0	1	0	0	800.0
			0	2	0	0	0	2	2	0	1	0	0	400.0
			0	2	0	0	0	2	2	0	1	0	0	1600.0
5102010	AC VOLTMETER	1	0	3	0	3	0	2	5	0	1	0	0	800.0
			0	3	0	5	0	2	7	0	1	0	0	400.0
			0	3	0	1	0	2	3	0	1	0	0	1600.0
5102020	DC VOLTMETER	1	0	5	0	3	0	3	6	0	3	0	0	800.0
			0	5	0	5	0	3	8	0	3	0	0	400.0
			0	5	0	1	0	3	4	0	3	0	0	1600.0
5102030	DC LOADMETER	2	0	10	0	0	0	6	6	0	6	0	0	800.0
			0	10	0	0	0	6	6	0	6	0	0	400.0
			0	10	0	0	0	6	6	0	6	0	0	1600.0
5102040	CLOCK	1	0	19	0	1	0	12	13	0	9	0	0	400.0
			1	19	0	2	0	11	14	0	9	0	0	200.0
			0	20	0	1	0	12	13	0	9	0	0	800.0

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	CPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
5102060	MASTER CAUTION LIGHT	1	1 2 0	8 7 8	0 0 0	0 1 0	1 2 0	9 8 9	10 10 10	1 1 0	7 6 7	1 1 1	0 0 0	100.0 50.0 200.0
5102070	MASTER FIRE WARNING LIGHT	1	0 0 0	3 3 3	0 0 0	0 0 0	0 0 0	7 7 7	7 7 7	0 0 0	3 3 3	0 0 0	0 0 0	800.0 400.0 1600.0
5102080	CAUTION LIGHT	16	0 0 0	21 21 21	0 0 0	1 2 0	0 0 0	17 17 17	18 19 18	0 0 0	12 12 12	1 1 1	0 0 0	800.0 400.0 1600.0
5103040	LINE/HOSE	15	0 0 0	3 3 3	0 0 0	1 2 0	0 0 0	2 2 2	3 4 3	0 0 0	2 2 2	0 0 0	0 0 0	800.0 400.0 1600.0
5106010	DUAL TACH INDICATOR	1	2 4 1	7 5 8	8 7 8	1 1 0	1 3 1	5 4 6	15 15 15	1 2 1	4 3 5	0 0 0	0 0 0	100.0 50.0 200.0
5106030	OIL TEMPERATURE INDICATOR	1	0 1 0	3 3 3	8 7 8	1 1 0	0 0 0	2 2 2	10 11 10	0 0 0	2 2 2	0 0 0	0 0 0	100.0 50.0 200.0
5106050	OIL PRESSURE INDICATOR	1	1 2 0	7 5 8	8 7 8	1 1 0	1 3 1	5 4 6	15 15 15	1 2 1	4 3 5	0 0 0	0 0 0	100.0 50.0 200.0
5106070	FUEL PRESSURE INDICATOR	1	1 3 1	4 3 5	8 7 8	1 1 0	1 2 0	3 2 4	12 13 12	1 1 0	3 2 3	0 0 0	0 0 0	100.0 50.0 200.0

INSP SCHEME - 22
HELO MODEL - UH-1

INSPECTION SCHEME COMPONENT SUMMARY

RATES PER 10,000 FLIGHT-HOURS

WUC	NOMENCLATURE	CPA	PREV RE-PAIR	UNSCH RE-PAIR	F.R. INSP M/H	SCHD INSP M/H	PREV REPR M/H	UNSCH REPR M/H	TOTAL M/H	PREV REPR EMT	UNSCH REPR EMT	MIS-SION ABORT	IN-FLT ABORT	INTVL BETW INSP
5106090	TORQUE INDICATOR	1	0	12	8	0	0	7	15	0	7	0	0	400.0
			0	12	8	0	0	7	15	0	7	0	0	200.0
			0	12	8	0	0	7	15	0	7	0	0	800.0
5106110	EXHAUST GAS TEMP INDICATOR	1	1	15	8	12	1	27	45	1	16	0	0	200.0
			2	14	8	24	3	26	61	2	16	0	0	100.0
			0	16	8	6	1	28	43	0	17	0	0	400.0
5107010	OIL PRESSURE INDICATOR	1	0	3	8	0	0	3	11	0	3	0	0	800.0
			0	3	8	0	0	3	11	0	3	0	0	400.0
			0	3	8	0	0	3	11	0	3	0	0	1600.0
5107040	TACH INDICATOR	1	0	6	8	0	0	6	14	0	4	1	0	800.0
			0	6	8	0	0	6	14	0	4	1	0	400.0
			0	6	8	0	0	6	14	0	4	1	0	1600.0
5107060	OIL TEMPERATURE INDICATOR	1	0	3	8	0	0	4	12	0	2	0	0	800.0
			0	3	8	0	0	4	12	0	2	0	0	400.0
			0	3	8	0	0	4	12	0	2	0	0	1600.0
5108010	FUEL QUANTITY INDICATOR	1	5	11	8	7	3	5	27	2	6	0	0	100.0
			10	6	7	14	7	5	33	5	4	0	0	50.0
			2	13	8	3	2	11	24	1	8	0	0	200.0